COSMAS, TASUED
Ijagun Journal of Social and Management Sciences

# Public Private Partnerships in Land Transportation: A Solution for Sustainable Urban Mobility in Nigeria

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**Abstract**
Urban mobility in Nigeria is increasingly challenged by rapid urbanization, inadequate transport infrastructure, and severe traffic congestion. Public-Private Partnerships (PPPs) have been recognized as a viable strategy to enhance land transportation development by leveraging private sector investment and expertise. This study examined the trends and patterns of PPPs in land transportation, assesses their impact on urban mobility efficiency, and analyzed their social and economic effects on urban communities. Using secondary data, descriptive statistics, and trend line charts, the findings revealed that PPP-led transportation projects have contributed to reduce travel time, lower congestion levels, and improved public transport reliability in major Nigerian cities, particularly Lagos and Abuja. Furthermore, PPP initiatives have stimulated economic growth, employment generation, and social inclusion. However, challenges such as regulatory inconsistencies, affordability concerns, and unequal access to transportation infrastructure persist. The study recommended strengthening regulatory frameworks, expanding PPP investments to underserved areas, integrating sustainable transport solutions, and fostering public engagement By implementing these strategies, Nigeria can ensure that PPP-driven transportation initiatives contribute to sustainable urban mobility, fostering long-term economic and social development.

**Keywords:** Public Private Partnership (PPPs), Land Transportation, Urban Mobility, Traffic Congestion, Social Inclusion

## 1. Introduction

The rapid urbanization of cities worldwide has placed immense pressure on transportation infrastructure, necessitating innovative approaches to ensure sustainable urban mobility. Public-Private Partnerships (PPPs) have emerged as a viable solution to address the challenges of inadequate funding, inefficiencies in public transportation, and the growing demand for modernized transport networks (World Bank, 2020). By leveraging private sector investment, expertise, and technology, PPPs contribute to the development of efficient, cost-effective, and environmentally sustainable transportation systems (Litman, 2019). In many developing economies, including Nigeria, the strain on urban mobility due to rising population growth and vehicular congestion has exposed the limitations of government-funded transportation projects (Akinyemi & Zuidgeest, 2018). Traditional public transportation systems often suffer from underfunding, poor maintenance, and lack of technological integration, leading to inefficiencies that affect economic productivity and quality of life (Gwilliam, 2017). As a result, governments are increasingly turning to PPPs as a strategy to develop and manage transport infrastructure more effectively.

PPPs in land transportation involve collaborative agreements where private entities finance, build, and operate transport projects while the government provides regulatory oversight and strategic direction (Engel et al., 2020). Successful cases of PPP-led transportation projects, such as the Lekki Epe Expressway in Lagos, Nigeria, demonstrate the potential of these partnerships in delivering high-quality infrastructure, reducing traffic congestion, and improving commuter experiences (Ogunleye, 2021). Furthermore, PPPs enable the adoption of smart mobility solutions, such as Bus Rapid Transit (BRT) systems, intelligent traffic management, and electric mobility, which contribute to environmental sustainability and long-term urban planning goals (Dimitriou & Gakenheimer, 2019).

Despite their advantages, PPPs in land transportation face challenges, including policy inconsistencies, funding risks, and public opposition to privately managed toll roads (Zhang, 2018). Addressing these concerns requires well-structured legal frameworks, transparent contract management, and stakeholder

Adebajo A. A. and Johnson O. O. (2025). Public Private Partnerships in Land Transportation: A Solution for Sustainable Urban Mobility in Nigeria, Ijagun Journal of Social and Management Sciences (JOSMAS), vol. 18, no. 1, pp. 20-24.

engagement to ensure equitable access to transportation services. This study explores the role of PPPs in achieving sustainable urban mobility, assessing their impact on transportation infrastructure, efficiency, and environmental sustainability, the study achieved its aim by addressing these objectives, analyze the trends and patterns of Public-Private Partnerships (PPPs) in land transportation development globally and in Nigeria, evaluate the impact of PPP led transportation projects on urban mobility efficiency by examining secondary data on travel time reduction, congestion levels, and public transport reliability before and after PPP interventions and examine the social and economic effects of PPP-based transportation initiatives on urban communities.

## 2. Literature Review

### *2.1 Introduction of Public-Private Partnerships (PPPs) in Land Transportation*

Public-Private Partnerships (PPPs) have emerged as a critical strategy for financing and managing land transportation infrastructure, particularly in developing countries where government resources are often insufficient to meet growing mobility demands (Hodge & Greve, 2017). PPPs involve long-term agreements between public agencies and private entities to develop, finance, operate, and maintain transport infrastructure (Yescombe, 2018). These partnerships offer financial relief to governments while leveraging private sector efficiency and innovation to enhance urban mobility (Verhoest et al., 2015).

### *2.2 The Role of PPPs in Sustainable Urban Mobility*

Urban mobility is a significant challenge in many cities, where traffic congestion, poor road conditions, and inefficient public transport systems hinder economic productivity and quality of life (Litman, 2019). Research suggests that PPPs can help mitigate these challenges by introducing modern infrastructure, such as Bus Rapid Transit (BRT) systems, toll roads, and intelligent transport solutions (Roehrich, Lewis, & George, 2014). For instance, in Lagos, Nigeria, the PPP-driven Lekki Epe Expressway project has contributed to improved road conditions and reduced congestion, demonstrating the benefits of private sector involvement in transportation (Owolabi, 2021). In other global examples, the Gautrain Rapid Rail Link in South Africa and the London Congestion Charging Scheme have successfully utilized PPP models to enhance transport efficiency while promoting sustainability through reduced emissions and better traffic management (Tang, Shen, & Cheng, 2010). These cases highlight the importance of structuring PPP contracts to ensure long-term benefits for both public and private stakeholders.

### *2.3 Economic and Financial implications of PPP in Transport Project*

One of the major advantages of PPPs is their ability to mobilize private investment for large-scale infrastructure projects, reducing the fiscal burden on governments (Engel, Fischer, & Galetovic, 2020). Studies show that well-structured PPP agreements lead to cost savings, improved project delivery timelines, and higher quality infrastructure (Grimsey & Lewis, 2017). However, challenges such as high financing costs, contractual disputes, and risk-sharing complexities have also been noted (Yescombe, 2018). In Nigeria, the financial sustainability of PPP projects remains a critical issue, as seen in cases where revenue projections from tolls and user fees did not meet expectations, leading to financial restructuring or government bailouts (Adebiyi & Oladipo, 2020). Understanding the economic feasibility of PPP projects requires thorough cost-benefit analysis, revenue modelling, and transparent financial reporting.

### *2.4 Social and Environmental Impact of PPPs in Transportation*

Beyond economic benefits, PPPs play a crucial role in shaping the social and environmental landscape of urban areas. Improved transportation networks have been linked to higher property values, increased business activities, and job creation in cities (Koppenjan & Enserink, 2009). However, concerns regarding equitable access, affordability, and displacement of low-income communities remain critical issues (Gwilliam, 2017). From an environmental perspective, PPP projects that incorporate smart transport solutions such as electric buses, non-motorized transport facilities, and eco-friendly road designs contribute to sustainability goals (Dimitriou & Gakenheimer, 2019). Countries with successful PPP implementations have prioritized green transportation policies and integrated environmental impact assessments into project planning.

### 2.5 Challenges and Risks in PPP Implementation

Despite their advantages, PPPs in transportation often face governance, regulatory, and operational challenges. Key risks include policy instability, unclear legal frameworks, and resistance from the public due to concerns over toll charges and privatization (Zhang, 2018). Studies indicate that transparent governance, stakeholder engagement, and robust risk-sharing mechanisms are essential for PPP success (Hodge & Greve, 2017). A critical challenge in Nigeria is the weak regulatory environment and lack of institutional capacity to oversee complex PPP projects effectively (Owolabi, 2021). Addressing these gaps requires policy reforms, capacity building, and improved contract management practices to ensure fair and efficient PPP agreements.

## 3. Research Methodology

### *3.1 Research Design*

This study employs a descriptive research design to analyze the trends and patterns of Public-Private Partnerships (PPPs) in land transportation development globally and in Nigeria. The approach focuses on examining historical data, policy frameworks, and financial models associated with PPP projects in the transportation sector. The use of secondary data analysis enables a comprehensive assessment of long-term trends and patterns.

### *3.2 Data Collection Method*

The study relies solely on secondary data sources,

which include, data from Nigerian transport agencies; Federal Ministry of Transportation, Nigerian Infrastructure Concession Regulatory Commission and global organization like World Bank, International Transport Forum. Academic Publication and Journals like peer reviewed research articles and case studies on PPPs in transportation from Scopus, Google Scholars and Research Gate, report from industries.

### *3.3 Data Analysis Techniques*

The study applies descriptive statistics and trend analysis to identify key patterns in PPP adoption, investment trend and project performance over time. It evaluates the impact of PPP led transportation projects on urban mobility efficiency by examining secondary data on travel time reduction, congestion levels, and public transport reliability before and after PPP interventions, examines the social and economic effects of PPP-based transportation initiatives on urban communities. The method include, descriptive analysis, trend line chart analysis.

## 4. Result and Discussion

***Objective One***: Analyze the trends and patterns of Public-Private Partnerships (PPPs) in land transportation development globally and in Nigeria

To analyse the trends and patterns of Public-Private Partnerships (PPPs) in land transportation development globally and in Nigeria, descriptive analysis and trend line chart was used to show the changes over time. The descriptive analysis is divided into two, the global trend in PPPs for land transportation and PPPs for land transportation in Nigeria. For the global trend, there was increase in PPP adoption over the past two decades, there has been a steady rise in PPP projects in road, rail and urban transit systems globally, in some of these regions, like in Europe and North America, there is extensive use of PPPs for road networks and urban transit in London Crossrail, Toronto Highway 407. In Asia, there are major PPP led railway projects, like Delhi Metro in India, China's high speed rail and in Africa there is gradual growth in PPPs for road expansion and BRT systems, particularly in Nigeria, Kenya and South Africa.

The Common PPP Models used globally are Build Operate Transfer (BOT), Design Build Finance Operate (DBFO) and Joint Ventures between governments and private firms.

For the PPPs in land transportation in Nigeria, there has been growth in the PPP Infrastructure Investment, which has expanded significantly from the 2000s, with major initiative including, Lekki Epe Expressway ( first major PPP toll road project), Lagos BRT system (PPP collaboration with Primero Transport Services), Abuja Kaduna Railway (financed partly through foreign investment and PPP funding).

The trend line shows the growth of PPP led transportation projects in Nigeria and globally from 2008 to 2023. The number of PPP transport projects globally has increased steadily from 15 projects in 2008 to 58 projects in 2023, this reflects global policy involvement in infrastructure financing, and the COVID 19 pandemic of 2020 to 2021 had minimal impact on global PPP growth, indicating resilience in transport investments. For Nigeria, the PPP projects grew from just 2 in 2008 to 18 in 2023, showing a positive growth, between 2012 and 2013, there was slow growth likely due to bottlenecks, economic downturns and investor concerns, there is also a rapid increase from 2017 onwards which suggests improved PPP frameworks and renewed investor confidence, however Nigeria still lags behind the global trend, indicating room for more PPP investment in transport development.

***Objective two:*** Evaluate the impact of PPP led transportation projects on urban mobility efficiency by examining secondary data on travel time reduction, congestion levels, and public transport reliability before and after PPP interventions.

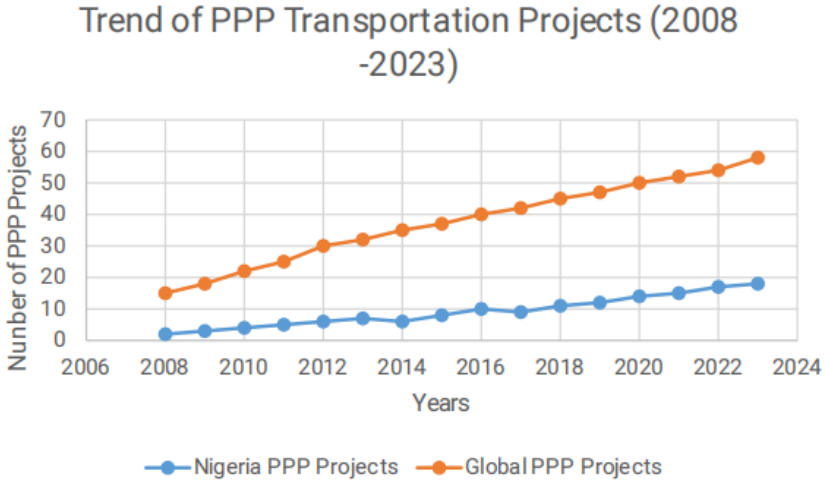


Figure 1: Trend of PPP Transportation Projects from 2008-2023 (Author's Fieldwork, 2024)

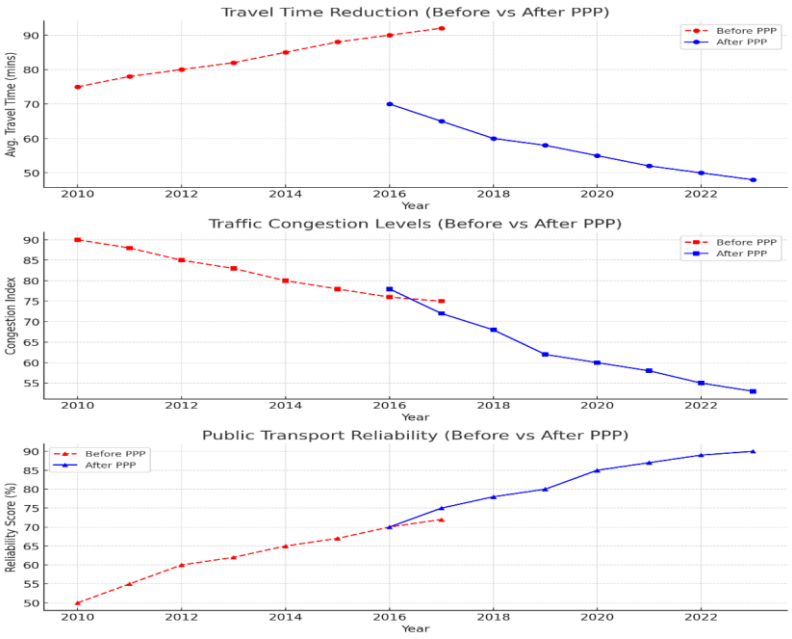


Figure 2: Showing the trend line chart for changes in travel time, congestion levels and transport reliability before and after PPP projects (Author's Fieldwork, 2024)


Figure 3: Showing the social and economic effects of PPP-based transportation initiatives on urban communities. (Author's Fieldwork, 2024)

The trend line chart revealed that before PPP interventions between 2010 and 2017 travel time steadily increased from 75 minutes to 92 minutes, indicating worsening congestion, after PPP intervention from 2016 to 2023, travel time decreased to 48 minutes reflecting improved infrastructure and traffic management. On Traffic Congestion Levels, before PPP projects, congestion was consistently high with index 90 to 75, while after PPP implementation, congestion reduced significantly with index 78 to 53,

showing an improved road capacity and better traffic flow. On Public Transport Reliability, before PPP projects, reliability was low, increasing slowly from 50% to 72%, after PPP projects, reliability improved to 90%, indicating better transport availability and efficiency. The result here reveals that, PPP led transportation projects significantly improved urban mobility efficiency by reducing congestion and travel time, public transport reliability increased demonstrating better service quality and infrastructure support, this finding suggest that PPP models are effective in enhancing urban transport systems.

***Objective three:*** Examine the social and economic effects of PPP-based transportation initiatives on urban communities.

The result revealed that before PPP based transportation initiatives, GDP growth was relatively slow, increasing from 2.5% to 3.8%, while after, PPP interventions the growth rate accelerated reaching 6.0% by 2023, this implies that improved transportation infrastructure positively influenced economic activities, trade and business operations. With respect to employment rate, before PPP employment rates increased slowly from 55% to 62%, after PPP investment, employment growth accelerated reaching 80% by 2023, which implies that PPP projects contributed to job creation particularly in construction, transportation and service industries. With respect to social inclusion index, it increased moderately before PPP interventions, after PPP projects, social inclusion improved significantly from 57% to 75% showing better access to transportation, increased mobility and reduced social disparities. Summary of the result shows that, the analysis on PPP based transportation initiatives significantly improved economic performance, employment and social inclusion in urban communities. The trend confirms that investing in PPP projects enhances urban mobility, stimulates economic growth and promotes social equity.

## 5. Conclusion and Recommendations

The study explored the role of Public Private Partnership (PPPs) in land transportation as a solution for sustainable urban mobility in Nigeria, with focus on three key objectives, trend and patterns of PPPs in Land Transportation. The analysis revealed that PPP adoption in Nigeria's transportation sectors has increased over the years especially in major cities like Lagos and Abuja, however irregular policy frameworks, funding constraints and bureaucratic challenges have hindered its full potential. The impact of PPP led Transportation Projects on Urban Mobility and Efficiency revealed that PPP initiatives have contributed to travel time reductions, lower congestion level and improved public transport reliability, however challenges such as maintenance issues and affordability concerns remain.

With respect to Social and Economic Effects of PPP Based Transportation, the study showed that PPP investment have stimulated economic activities, increased employment opportunities and improved social inclusion accessibility with benefits often concentrated in high income areas leaving low income populations underserved. Overall the study confirms that PPP based transportation development is a viable approach to achieving sustainable urban mobility in Nigeria but stronger governance, equitable policies and improved implementation strategies are needed for long term success. Based on the above findings, the study hereby recommend the following, that Nigeria government should establish clear and enforceable PPP policies that will ensure transparency, efficiency and fair risk sharing between the public and private sector, Urban transportation planning should be driven with periodic assessments of PPP projects to measure their effectiveness and identify areas for improvement, while many PPP projects focus on major cities, investment should be extended to secondary cities and peri urban areas to promote balanced regional development, incentives such as tax breaks and subsidies should be introduced to encourage private sector investments in transportation network serving low income communities, finally traffic regulations and subsidies should be implemented to ensure that PPP based transportation services remain affordable for all income groups and special attention should be given to developing inclusive transport solution, such as non-motorized transport (NMT) lanes, pedestrian friendly roads and accessible transport for persons with disabilities.

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