Assessment of Road Transport Infrastructure and Its Impact on Development in Ibadan North Local Government Area, Oyo State, Nigeria

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ABSTRACT

The growth and advancement of a society is determined and measured to a significant extent by the socioeconomic growth of the city. This is highly depending on the transportation infrastructure of the area in question. Transportation fosters growth in every place and when transportation is inhibited, development is likewise delayed. In Nigeria, and Ibadan North local government, Ibadan of Oyo state in particular, the sole accessible means of transportation is road transport. It offers the links between physically distant amenities, enabling social engagement, and access to places of primary employments and work. Road infrastructure is a vital factor of economic growth in the research geographical area. The needs for road transport infrastructure in Nigeria over the years have expanded significantly, while the supply of road transport services have fallen drastically. There is a miss-merge between the demand and supply of road infrastructure in the studied area. The research consequently, analyzed the availability and adequacy of road transport infrastructure in Ibadan North local government, Ibadan of Oyo state, Nigeria. Through personal observation and direct measurement of the existing road infrastructure, the study analyzed 31.65 kilometers of roads in Ibadan North. The results showed that approximately 70% of the roads were riddled with potholes, making travel difficult and unsafe. Furthermore, about 80% of the roads lacked sidewalks, posing serious risks to pedestrians. Nearly 90% of the roads were found to have no road signs, further exacerbating safety concerns. These findings underscore the need for immediate attention to the condition of roads in the area, as poor infrastructure hinders both economic activities and the safety of the public. This research emphasizes the urgent need for government intervention and public participation in the development and maintenance of road transport infrastructure in Ibadan North. Investing in road repairs, the installation of sidewalks, and the provision of road signs would significantly enhance the safety and efficiency of transportation in the region. This would not only improve mobility but also support the overall economic growth of the area, facilitating the movement of people, goods, and services and contributing to the development of the local economy.

Keywords: Socioeconomic growth, Transportation infrastructure, Road transport, Road adequacy, Pedestrian Safety.

INTRODUCTION

An effective, creative and integrated transportation system plays a crucial functions in boosting the quality of life and nourishing national growth by supporting the seamless movement of people, products, and services [26] Road transit, in particular, operates as the backbone of urban mobility, providing important links between geographically separated institutions and allowing social and economic interactions [18]. It stimulates economic growth by improving access to labor markets, resources, and services, hence unlocking the potential of urban regions to obtain competitive advantages in multiple industries [11].

Among the many kinds of transportation infrastructure are bridges, highways, railroads, seaports, and airports, which contribute to mobility systems. It significantly influences economic performance by determining accessibility and connectivity between and within urban centers [30]. However, in many developing nations, the demand for transportation infrastructure has continually exceeded its supply, leading to gaps that hamper

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the efficient running of cities and regions [27]. This discrepancy is particularly evident in Nigeria, where road transport is the primary mode of mobility, yet its infrastructure is often characterized by poor maintenance, insufficient capacity, unsafe conditions, among others [21].

Ibadan North Local Government, Oyo State, Nigeria, demonstrates these problems and challenges. As one of the most populous urban hubs in the country, the area relies largely on road transit for the transportation of people, products, and services. Yet, a substantial percentage of its road network is afflicted by issues like as potholes, lack of sidewalks, absence of road signs, and poor drainage systems [5]. As a result of these problems, not only is the safety and efficiency of transportation jeopardized, but also the region's socioeconomic progress is constrained.

This study intends to examine the adequacy and availability of road transport infrastructure in Ibadan North. It strives to highlight the compelling need for expanded governmental and public engagement in the creation, maintenance, and management of this vital infrastructure to enable sustainable urban expansion and improved living conditions in the study region.

Statement of the Problem

Urban transport issues in many developing nations, including Nigeria, are characterized by poor infrastructure, a mismatch between the demand for and supply of transport services, and frequent accidents. In Ibadan North Local Government Area (LGA) of Oyo State, the transportation sector reflects these difficulties, manifesting in traffic congestion, inadequate road amenities, and poor maintenance culture. Traffic congestion in Ibadan North LGA is mostly a result of poorly designed road layouts and uncontrolled urban expansion. This issue has been aggravated by unregulated land-use practices and the absence of strategic road network designs [5]. Parking is another important concern in the neighborhood, with the demand for parking places far exceeding the supply. As a result, road-side and illegal parking have become frequent, hindering traffic flow and producing further congestion [7]. The infrastructure to support commercial activity, such as defined sites for loading and offloading goods, is either inadequate or altogether nonexistent. This forces enterprises to use roadsides for these activities, thus exacerbating congestion and road usability [25].

Additionally, the lack of effective drainage systems has serious repercussions for road usage in Ibadan North LGA. During the rainy season (April to October), roads without proper culverts or side ditches typically flood, rendering them impassable and leading to rapid deterioration of road surfaces [3]. Furthermore, many roads lack crucial safety elements such as speed limit signs, warning signs for dangerous curves, and proper lighting, which increases the chance of accidents [10]. The financial and technical needs for maintaining, restoring, and reconstructing road infrastructure in the area exceed the resources available to local authorities. As a result, numerous roads remain in a condition of disrepair, impeding economic activity and lowering the general quality of life for people [19]. These transportation issues significantly affect vital sectors such as healthcare, education, and commerce, which rely substantially on efficient road networks for their operations [14].

Given these challenges, this study focuses on examining the sufficiency, functionality, and upkeep of road transport infrastructure in Ibadan North LGA. The research aims to identify available road transport infrastructure, evaluate their performance, and analyze the maintenance methods applied to enable sustainable development in the area.

The Study Area

Ibadan North Local Government Area (LGA) is located in the core of Ibadan, Oyo State, Nigeria, with coordinates around 7.3964° N latitude and 3.9017° W longitude. It is bordered by Ibadan Ido, Ibadan South East, Akinyele, and Ibadan North-East LGAs, including significant places Oyo state Secretariat, Sango, Bodija etc. Other key sites include the University of Ibadan, Ibadan National Museum, and Bower's Tower. The LGA includes a mix of residential, commercial, and institutional facilities, with vibrant marketplaces and vital transportation links, such as Iwo Road and Ojoo, facilitating movement across the city.

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Despite its strategic location, Ibadan North LGA confronts issues such traffic congestion, poor road maintenance, and inadequate infrastructure, which limit urban development. This study focuses on assessing the state of road transport infrastructure in the area.

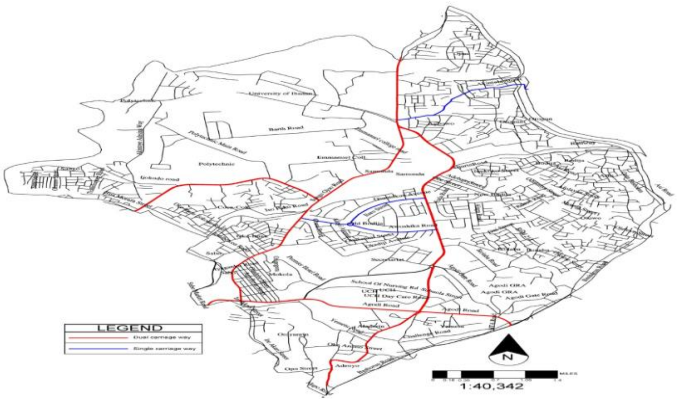

Fig. 1 Road network and the selected road corridors in Ibadan north LGA

Source: Author's Field Survey, 2025.

RESEARCH METHODOLOGY

This study uses both primary and secondary data to examine the road transport infrastructure in Ibadan North LGA, Ibadan, Oyo State. Primary data were acquired through measurement of 31.65 kilometers of road infrastructure (see fig. 1), dispersed over six designated road corridors within the LGA and personal observation involved the systematic visual inspection of selected road segments across six corridors, the categorization of sampled road corridors is shown in Table 1.0., this was carried out by the lead researcher and two trained assistants between January and February 2025. Observations focused on the condition of road surfaces, presence of potholes, pedestrian infrastructure, signage, and drainage systems. These observations were documented in field notebooks and supplemented with photographic evidence. Data was then cross-referenced with responses from administered questionnaires to validate consistency. The sample covered around 1.6% of the entire road network in Ibadan North. Field helpers measured essential road parameters such as the depth and width of potholes, road distances, and surface conditions. A total of 271 questionnaires were presented to road users to gather perceptions on road safety and conditions. The selected routes included both dual and single carriageways, with each corridor broken into three or four segments for proper depiction.

Secondary data were collected from the Oyo State Ministry of Works and Transport, Journal, Research papers, which supplied information on the total number of roads in the LGA, their ownership, and their status, including whether they were paved or unpaved. This secondary data helped complement the primary observations and supplied insights into the historical state of road infrastructure and continuing maintenance operations in the area.

Table 1.0 Sampled Road Network Categories

ROAD CATEGORIES	NUMBER OF ROADS	NUMBER SELECTED ROADS CORRIDOR	SELECTED ROAD CORRIDOR	LENGTH	SEGMENTS	SEGMENTS ID	LENGTH	SAMPLE SIZE
			Sango-Poly-Eleyele	5.12km	3	Sango- poly	0.85km	7
						Poly-Ijokodo junction	1.1km	9

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DUAL CARRIAGE WAY	5	4				Ijokodo junction-Eleyele	3.17km	27
			UI-Bodija-Secretariat – Beere	9.2km	4	UI-Ojurin Bodija	0.9km	7
						Ojurin Bodija-Secretariat	1.6km	13
						Secretariat-Totalgarden	1.76km	15
						Total garden-Beere	4.94km	41
			Agodi gate-Total garden-Mokola-Sabo	4.24km	3	Agodi gate-Total garden	1.3km	11
						Total garden-Mokola	2.23km	19
						Mokola-Sabo	0.71km	7
			Ojoo-UI-Sango-Mokola	8.1km	3	Ojoo-UI	3.17km	27
						UI-Sango	2.36km	20
						Sango-Mokola	2.57km	22
SINGLE CARRIAGE WAY	149	2	Elewure-Awolowo-Osuntokun	2.89km	3	Elewure-Housing	0.6km	6
						Housing-Osuntokun	1.16km	10
						Housing-Awolowo	1.13km	9
			UI-Agbowo-Express	2.1km	3	UI-Agbowo	0.5km	6
						Agbowo-Celestial	0.65km	7
						Celestial - Express	0.95km	8
TOTAL	**154**	**6**	**-**	**31.65km**	**19**			**271**

Source: Author's Field Survey, 2025

The evaluation of the road infrastructure was based on several important indicators: road distances, lanes, surface conditions, pothole characteristics, and the availability of drainage systems and other supporting equipment. Roads were categorized on a scale from 1 to 5, with 1 reflecting bad conditions and 5 representing outstanding conditions. Data analysis was undertaken using descriptive statistics, such as percentages, averages, and tabulation, to describe and interpret the findings. Statistical software (SPSS) was utilized for the analysis, providing a complete assessment of the state of the roads and indicating locations in need of improvement.

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Presentation and Analysis of Data

Table 2 Road Surface Condition Analysis

Road Corridor	**Total Length (km)**	**Good Condition (%)**	**Fair Condition (%)**	**Poor Condition (%)**	**Total**
Sango-Poly-Eleyele	5.12	35	40	25	43
UI-Bodija-Secretariat-Beere	9.2	20	45	35	76
Agodi Gate-Total Garden-Mokola-Sabo	4.24	28	50	22	37
Ojoo-UI-Sango-Mokola	8.1	25	48	27	69
Elewure-Awolowo-Osuntokun	2.89	30	40	30	25
UI-Agbowo-Express	2.1	18	42	40	21
Total	**31.65**	**156 (29.8%)**	**265 (47.2%)**	**193 (35.7%)**	**271**

The analysis of road surface conditions in Ibadan North reveals significant variability in road quality across different corridors as shown in table 2. Approximately 29.8% of the road network is in good condition, while 47.2% is fair, and 35.7% is in poor condition. The UI-Bodija-Secretariat-Beere corridor, at 9.2 km, accounts for the largest section of fair and poor road conditions, with only 20% categorized as good. Comparatively, the Sango-Poly-Eleyele corridor, despite its shorter length of 5.12 km, has the highest percentage (35%) of roads in good condition.

This disparity in road surface quality reflects the uneven distribution of maintenance efforts, consistent with findings by [2] that poor road maintenance and resource allocation often exacerbate road infrastructure challenges in Nigerian cities. The analysis underscores the need for targeted interventions to improve road quality, particularly in heavily trafficked corridors like UI-Bodija-Secretariat-Beere, where poor conditions can impede mobility and increase travel time.

Table 3 Pothole Distribution and Severity

Road Corridor	**Total Length (km)**	**Number of Potholes**	**Average Depth (cm)**	**Average Width (cm)**	**Total**
Sango-Poly-Eleyele	5.12	50	12	22	43
UI-Bodija-Secretariat-Beere	9.2	160	15	25	76
Agodi Gate-Total Garden-Mokola-Sabo	4.24	70	10	20	37
Ojoo-UI-Sango-Mokola	8.1	100	14	26	69
Elewure-Awolowo-Osuntokun	2.89	52	9	18	25
UI-Agbowo-Express	2.1	40	8	17	21
Total	**31.65**	**472**	**-**	**-**	**271**

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Table 3 shown the pothole distribution across the study area varies significantly, with a total of 472 potholes recorded. The UI-Bodija-Secretariat-Beere corridor exhibits the highest number of potholes (160), with average depths and widths of 15 cm and 25 cm, respectively, highlighting the severity of road degradation in this area. In contrast, UI-Agbowo-Express records the least pothole count (40) with smaller dimensions (average depth of 8 cm).

The concentration of potholes along major corridors aligns with high vehicular traffic and delayed maintenance, as supported by [22], who observed that roads with high usage tend to deteriorate faster in the absence of timely repairs. Addressing these potholes is essential to improve ride quality and reduce vehicular wear and tear.

Table 4 Drainage Infrastructure Assessment

Road Corridor	**Total Length (km)**	**Drainage Present (%)**	**Functional Drainage (%)**	**Flood-Prone Sections (No.)**	**Total**
Sango-Poly-Eleyele	5.12	75	50	3	43
UI-Bodija-Secretariat-Beere	9.2	70	45	5	76
Agodi Gate-Total Garden-Mokola-Sabo	4.24	80	55	2	37
Ojoo-UI-Sango-Mokola	8.1	72	47	4	69
Elewure-Awolowo-Osuntokun	2.89	30	40	5	25
UI-Agbowo-Express	2.1	45	38	4	21
Total	**31.65**	**362 (59.6%)**	**275 (45.0%)**	**18**	**271**

As reveal in table 4, the assessment shows that only 59.6% of the roads have drainage systems, and even fewer (45.0%) are functional. Corridors like Agodi Gate-Total Garden-Mokola-Sabo exhibit the highest drainage presence (80%), yet only 55% are operational, leaving the corridor vulnerable to flooding. The Elewure-Awolowo-Osuntokun corridor, with only 30% drainage presence, demonstrates a critical infrastructure gap, evidenced by the highest number of flood-prone sections (5).

This uneven drainage provision highlights urban planning challenges. According to [13], inadequate drainage systems in urban areas contribute significantly to flooding, infrastructure damage, and economic losses. Proactive measures, including retrofitting existing drainage systems and increasing their capacity, are vital for flood mitigation.

Table 5 Pedestrian Facilities Analysis

Road Corridor	**Total Length (km)**	**Sidewalks Present (%)**	**Pedestrian Crossings (%)**	**Road Signs (%)**	**Total**
Sango-Poly-Eleyele	5.12	50	15	15	43
UI-Bodija-Secretariat-Beere	9.2	48	10	20	76
Agodi Gate-Total Garden-Mokola-Sabo	4.24	55	18	18	37
Ojoo-UI-Sango-Mokola	8.1	45	12	10	69

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Elewure-Awolowo-Osuntokun	2.89	18	10	5	25
UI-Agbowo-Express	2.1	12	8	8	21
Total	**31.65**	**278 (45.5%)**	**143 (23.5%)**	**196 (32.4%)**	**271**

Pedestrian infrastructure across the study area remains inadequate, table 5 reveal that only 45.5% of sidewalks present and 23.5% of pedestrian crossings available. The Agodi Gate-Total Garden-Mokola-Sabo corridor records the highest percentage of sidewalks (55%), while Elewure-Awolowo-Osuntokun and UI-Agbowo-Express have the lowest availability at 18% and 12%, respectively.

The lack of pedestrian crossings and road signs further compromises safety, corroborating findings by [20] who noted a direct link between insufficient pedestrian facilities and higher accident rates in Nigerian cities. Enhancing pedestrian infrastructure is crucial for promoting walkability and ensuring safety, especially in corridors with significant pedestrian traffic.

Table 6 Traffic Volume and Congestion Levels

Road Corridor	**Peak Hour Traffic (Vehicles/Hour)**	**Average Congestion Level (%)**	**Major Bottlenecks (No.)**	**Total**
Sango-Poly-Eleyele	220	55	2	43
UI-Bodija-Secretariat-Beere	540	70	5	76
Agodi Gate-Total Garden-Mokola-Sabo	300	60	3	37
Ojoo-UI-Sango-Mokola	480	68	4	69
Elewure-Awolowo-Osuntokun	210	48	2	25
UI-Agbowo-Express	190	45	2	21
Total	**2720**	**-**	**18**	**271**

According to table 6, traffic congestion is most severe along the UI-Bodija-Secretariat-Beere corridor, with peak hour traffic reaching 540 vehicles/hour and a congestion level of 70%. Major bottlenecks are concentrated in this corridor (5), exacerbating delays and increasing emissions. In contrast, the UI-Agbowo-Express corridor has the lowest congestion level (45%) and traffic volume (190 vehicles/hour), reflecting its lower usage.

The findings align with [15], who observed that congestion levels in urban areas are closely tied to road capacity and the absence of efficient traffic management systems. Addressing these issues requires interventions such as expanding road capacity, implementing intelligent traffic systems, and encouraging alternative modes of transportation.

SUMMARY OF FINDINGS

The findings of this study indicate that the road infrastructure in Ibadan North, Oyo State, faces several challenges. Most roads are in poor or fair condition, with nearly half (47.2%) of the roads being in fair condition and over a third (35.7%) in poor condition. Roads like UI-Bodija-Secretariat-Beere, Agodi Gate-Mokola-Sabo, and Ojoo-UI-Sango-Mokola are particularly problematic due to insufficient maintenance and heavy traffic. Potholes are a significant issue across the area, with a total of 472 potholes observed, many of which are wide and deep. This is consistent with other studies, such as those by [23], who noted the adverse impact of potholes on road safety and mobility in Nigerian cities. Drainage infrastructure is another concern,

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with only 45% of roads having functional drainage systems, which contributes to flooding. This lack of proper drainage has been linked to road deterioration [1]. Pedestrian facilities are lacking, with only 45.5% of roads having sidewalks, and fewer still (23.5%) having pedestrian crossings. This lack of infrastructure poses serious safety risks for pedestrians, as noted by [24] in their study of urban pedestrian safety in Nigeria. Traffic congestion remains a significant issue, especially in the Mokola-Sabo corridor, where peak-hour traffic often exceeds road capacity, creating bottlenecks and delays.

RECOMMENDATIONS

Based on these findings, several recommendations are proposed. First, there is a need for a systematic road maintenance program to address the poor road surface conditions, especially in high-traffic areas like UI-Bodija-Secretariat-Beere and Ojoo-UI-Sango-Mokola. Regular repairs can prevent roads from deteriorating further and reduce the number of potholes. This is in line with the recommendation of [9], who stressed the importance of routine maintenance in urban road networks. Second, improving drainage infrastructure should be a priority. Given the flood-prone nature of many areas, effective drainage systems can prevent road damage and reduce flooding, as recommended by [4]. Third, to enhance pedestrian safety, the local government should invest in building sidewalks, pedestrian crossings, and road signs, especially in areas with significant foot traffic. This would help reduce pedestrian accidents, which have been highlighted in the work of [17] as a major concern in Nigerian cities. Finally, traffic congestion could be alleviated through improved traffic management systems, such as the installation of traffic lights, dedicated bus lanes, and better signage, particularly in heavily congested areas like Mokola-Sabo. These efforts align with the work of [12], who found that efficient traffic management could significantly reduce congestion in Nigerian cities.

CONCLUSION

In conclusion, this study has highlighted several key challenges related to road infrastructure in Ibadan North, including poor road conditions, inadequate pedestrian facilities, ineffective drainage systems, and severe traffic congestion. Addressing these issues will require a combination of regular maintenance, infrastructure investment, and effective traffic management. By prioritizing these areas, the local government can enhance road safety, reduce congestion, and improve overall urban mobility. As noted by [8], improving road infrastructure is crucial for promoting sustainable urban development in Nigerian cities. This research offers valuable insights that can inform urban planning and policy decisions aimed at creating safer, more efficient road networks in Ibadan North and similar urban areas.

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