RESILIENCE AND LIVABLE CITIES IN A WARMING WORLD

A FESTSCHRIFT IN HONOUR OF

TPL. DR. JOSHUA ADEWUMI ADEBISI FNITP, RTP



EDITED BY

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Editors:
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CHAPTER 25

RESIDENTS' APPRAISAL OF URBAN MOBILITY AND LOW CARBON TRANSPORT SOLUTIONS IN IBADAN, OYO STATE

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Abstract

Rapid urbanization in many Nigerian cities has intensified transportation challenges such as traffic congestion, air pollution, and increasing greenhouse gas emissions. However, these challenges continue to significantly affect urban mobility, accessibility and environmental sustainability. This study examines urban mobility patterns and the prospects of low-carbon transport solutions in Ibadan towards improving commuting and reducing transport-related greenhouse emission in the city. The research evaluates existing transport systems, residents' travel behaviour, and awareness of sustainable transport options. A questionnaire survey was administered to urban residents to collect data on transport modes, travel frequency, perception of congestion, and willingness to adopt low-carbon alternatives such as public transport, cycling, and electric vehicles. Findings reveal that private cars and motorcycles dominate daily mobility due to inadequate public transportation and poor infrastructure for non-motorized movement. Respondents also indicated high levels of traffic congestion and air pollution in major parts of the city. However, many residents expressed willingness to adopt low-carbon transport if government improves infrastructure and affordability. The study concludes that promoting mass transit, improving road infrastructure, and supporting environmentally friendly transport technologies are necessary steps toward sustainable urban mobility in Ibadan.

Keywords: Urban mobility, low-carbon transport, sustainable cities, climate change mitigation.

1.0 Introduction

Transportation is a fundamental component of urban development and plays a significant role in promoting economic growth, social interaction, and environmental sustainability. Efficient transportation systems facilitate the movement of people, goods, and services, thereby enhancing productivity and improving the quality of life of urban residents and city livability (Akanmu, Gbadamosi & Omole, 2022). In rapidly urbanizing cities, the demand for transportation services continues to increase as a result of population growth, economic expansion, and spatial development. Consequently, urban mobility has become a critical issue in urban planning and sustainable development discourse across the world. Urban mobility refers to the ability of people and goods to move efficiently, safely, and affordably within urban areas through various transportation means including private vehicles, public transit systems, motorcycles, tricycles, cycling, and walking (Salisu & Akanmu, 2024).

Importantly, effective urban mobility systems contribute to economic competitiveness by reducing travel time, increasing accessibility to opportunities, and enhancing social inclusion, while inefficient mobility systems often result in traffic congestion, environmental pollution, increased transportation costs, and reduced productivity (Salisu, Akanmu, Fasina & Sanni, 2022). In many developing countries, particularly in Sub-Saharan Africa, rapid urbanization has placed enormous pressure on existing transportation infrastructure. Cities are expanding at unprecedented rates while transportation facilities and services struggle to keep pace with increasing demand. This imbalance has led to severe mobility challenges characterized by overcrowded roads, inadequate public transportation systems, poor road infrastructure, and increased dependence on informal transportation modes. As a result, urban residents frequently experience long travel times, traffic delays, and limited access to efficient mobility options. Nigeria, as Africa's most populous country, faces significant transportation challenges arising from rapid urban growth and increasing urbanization. Major cities such as Lagos, Abuja, Port Harcourt, Kano, and Ibadan have witnessed substantial increases in population over the past few decades. This growth has intensified demand for transportation services and contributed to rising traffic congestion, road deterioration, air pollution, and greenhouse gas emissions (Akanmu & Salisu, 2024). Thus, transportation sector has become one of the major contributors to environmental degradation due to its dependence on fossil fuels and inefficient mobility patterns.

Ibadan, the capital city of Oyo State, represents one of the largest metropolitan areas in Nigeria and serves as an important commercial, educational, and administrative centre. The city has experienced continuous population growth and spatial expansion, leading to increased transportation demand and mobility challenges. Residents rely heavily on a combination of private vehicles, commercial buses, motorcycles (popularly known as *okada*), and tricycles for daily movement. While these transport modes provide accessibility and flexibility, they also contribute to traffic congestion, road safety concerns, fuel consumption, and environmental pollution.

One of the most pressing concerns associated with urban transportation is its contribution to climate change and environmental degradation. The transportation sector is a significant source of greenhouse gas emissions, particularly carbon dioxide (CO_2), which contributes to global warming and climate change. The increasing use of fossil-fuel-powered vehicles in urban areas has resulted in higher levels of air pollution, deteriorating environmental quality, and adverse health outcomes. These environmental challenges have prompted governments, researchers, and international organizations to advocate for sustainable transportation systems capable of reducing emissions while maintaining mobility efficiency. In response to these concerns, the concept of low-carbon transportation which is transportation systems and practices designed to minimize greenhouse gas emissions while ensuring efficient movement of people and goods. has gained global attention as a sustainable approach to urban mobility (Akanmu & Salisu, 2025). Such systems include improved public transportation, electric vehicles, non-motorized transportation such as cycling and walking, clean energy technologies, and integrated urban transport. The adoption of low-carbon transportation offers numerous benefits including reduced environmental pollution, lower fuel consumption, improved public health, and enhanced urban sustainability.

Despite the growing recognition of sustainable transportation globally, the implementation and adoption of low-carbon transport solutions in many Nigerian cities remain limited. It is against this background that this study examines urban mobility patterns and evaluates the prospects of low-carbon transport solutions in Ibadan, Nigeria. The study investigates the dominant transport modes used by residents, identifies the major challenges affecting urban mobility within the city, assesses residents' awareness and perception of low-carbon transport systems, evaluates their willingness to adopt sustainable transportation alternatives, and explores practical strategies for promoting environmentally sustainable urban transportation.

2.0 Literature Review

2.1 Conceptual and Theoretical Framework

The concept of urban mobility has become increasingly important in contemporary urban transport and sustainable development discussions. Urban mobility refers to the movement of people and goods within urban environments through various modes of transportation. It encompasses the accessibility, efficiency, affordability, convenience, and sustainability of transportation systems that enable individuals to participate in economic, social, educational, and recreational activities. Effective urban mobility is essential for improving the quality of life of residents and promoting economic growth, while poor mobility systems often result in congestion, environmental degradation, and reduced productivity.

In recent decades, rapid urbanization has significantly altered mobility patterns in many cities across the world with the increasing concentration of population in urban areas has led to greater demand for transportation services and infrastructure (Ogunsesan, Akanmu & Salisu, 2022). As cities expand, residents travel longer distances to access employment opportunities, educational institutions, healthcare facilities, markets, and other essential services. Consequently, transportation systems face increasing pressure, particularly in developing countries where infrastructure development often lags behind population growth. Likewise, urban mobility patterns are indispensable to sustainable mobility in within a city. These patterns according to Rodrigue, Comtois & Slack (2013) include the choice of transportation mode, travel frequency, travel purpose, commuting distance, travel time, and route selection. However, mobility patterns in many Nigerian cities are characterized by heavy dependence on road transportation, particularly commercial buses, motorcycles, tricycles, and private vehicles.

One of the major concerns associated with urban mobility is traffic congestion which occurs when the volume of vehicles on a road exceeds it carrying capacity, resulting in slower movement, delays, and increased travel time (Rodrigue et al, 2013). Congestion has become a persistent problem in many urban centres due to population growth, inadequate road infrastructure, poor traffic management, and increasing vehicle ownership with adverse consequences according to Gbadamosi & Akanmu (2019) including economic losses, increased fuel consumption, environmental pollution, and reduced quality of life. Also, another critical issue linked to urban mobility is environmental sustainability vis-à-vis transport-related greenhouse gas emissions

particularly carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) (Akanmu & Salisu, 2024). These emissions no doubt, are major contributors to global climate change and environmental degradation due to the notion that conventional transportation systems that rely heavily on fossil fuels release substantial amounts of pollutants into the atmosphere, resulting in poor air quality and adverse public health outcomes (Odesanya, 2021).

Meanwhile, low-carbon transport solutions include efficient public transportation systems, electric vehicles, cycling infrastructure, pedestrian-friendly facilities, rail transportation, and the use of renewable energy are now in vanguard of sustainable transportation operations. These solutions aim to reduce carbon emissions, improve energy efficiency, and enhance urban sustainability. Unlike conventional transportation systems, low-carbon transport seeks to achieve mobility objectives while minimizing environmental impacts. Public transportation is one of the most effective low-carbon transport strategies. Mass transit systems such as buses, Bus Rapid Transit (BRT), light rail transit, and metro systems can move large numbers of passengers using less energy per capita compared to private vehicles. Improved public transportation reduces traffic congestion, lowers fuel consumption, and decreases greenhouse gas emissions. Furthermore, efficient public transport systems enhance accessibility and social inclusion by providing affordable mobility options for residents. Also, cycling and walking represent important forms of non-motorized transportation that produce little or no greenhouse gas emissions and contribute to healthier lifestyles (Gbadamosi, Omole & Akanmu, 2021). The development of bicycle lanes, pedestrian walkways, and safe crossing facilities encourages residents to adopt active transportation modes. In many developed countries, investments in cycling and pedestrian infrastructure have significantly improved urban mobility while reducing environmental pollution, while electric vehicles have also emerged as a key component of low-carbon transportation systems (Akanmu, Salisu, Fasina & Sanni, 2022). Unlike conventional vehicles powered by petrol or diesel engines, electric vehicles operate using electricity and produce lower direct emissions, while advances in battery technology continue to improve vehicle performance and affordability, electric mobility is becoming increasingly viable as a sustainable transportation option.

Therefore, the relationship between urban mobility and low-carbon transport can be explained through a conceptual framework that links transportation systems, travel behaviour, environmental outcomes, and sustainability objectives. Thus, urban residents choose transportation modes based on factors such as cost, accessibility, convenience, travel time, and infrastructure availability. These mobility choices influence transportation demand and environmental impacts. Where sustainable transport infrastructure is inadequate, residents tend to rely on conventional fossil-fuel-powered vehicles, resulting in higher emissions and increased environmental degradation. Conversely, the availability of efficient low-carbon transport alternatives encourages sustainable travel behaviour and contributes to environmental sustainability.

3.0 Materials and Methods

3.1 The Study Area: Ibadan Metropolis, Nigeria

The study was conducted in Ibadan Metropolis, the capital city of Oyo State, located in the south-western region of Nigeria. Ibadan is one of the largest indigenous cities in sub-Saharan Africa and serves as a major administrative, commercial, educational, and transportation centre. The city is situated approximately 145 km northeast of Lagos and lies between latitude 7°15′N and 7°30′N and longitude 3°45′E and 4°00′E. It occupies an estimated land area of about 3,080 square kilometres and is characterized by a tropical wet-and-dry climate with distinct rainy and dry seasons.

Ibadan is bounded by Akinyele Local Government Area to the north, Ido Local Government Area to the west, Lagelu and Ona Ara Local Government Areas to the east, and Oluyole Local Government Area to the south. Administratively, the metropolis comprises eleven Local Government Areas (LGAs), including Ibadan North, Ibadan North-East, Ibadan North-West, Ibadan South-East, Ibadan South-West, Akinyele, Egbeda, Ido, Lagelu, Oluyole, and Ona Ara. The strategic location of the city has contributed significantly to its growth as a major urban centre and transportation hub within southwestern Nigeria.

Transportation within Ibadan is predominantly road-based (Akanmu & Salisu, 2024). The city is connected to major Nigerian cities through important road corridors such as the Lagos–Ibadan Expressway, Ibadan–Ife Road, Ibadan–Ilorin Road, and Ibadan–Oyo Road. Daily movement within the metropolis is facilitated through private vehicles, commercial buses, taxis, tricycles (*keke napep*), and motorcycles (*okada*). Despite the availability of these transport modes, the city experiences persistent transportation challenges, including traffic congestion, inadequate public transportation services, poor road infrastructure, environmental pollution, and increasing travel costs. These challenges make Ibadan a suitable case study for examining urban mobility patterns and evaluating the prospects of low-carbon transport solutions for sustainable transportation.

3.2 Methodology

The study adopted a descriptive survey research design to investigate urban mobility patterns and assess the prospects of low-carbon transport solutions in Ibadan Metropolis. The survey approach was considered appropriate because it enabled the collection of information directly from urban residents regarding their travel behaviour, transportation preferences, perception of mobility challenges, awareness of low-carbon transportation systems, and willingness to adopt sustainable transport alternatives.

The target population comprised all residents of Ibadan Metropolis who regularly engage in urban transportation activities. According to the National Population Commission (2006), Ibadan had a population of approximately 2.56 million people. Applying an annual population growth rate of 2.5%, the projected population of the metropolis exceeds three million inhabitants. Given the large population size and the exploratory nature of the study, a sample of 145 respondents was selected using a simple random sampling technique. The respondents were drawn from major residential, commercial, and transportation corridors including Dugbe, Bodija, Mokola,

Sango, Challenge, Agodi, and Ojoo. The sampling technique ensured that residents from different socio-economic backgrounds and travel characteristics had equal opportunities to participate in the study.

Both primary and secondary sources of data were utilized. Primary data were collected through the administration of structured questionnaires to residents across the selected locations. The questionnaire was designed to obtain information on respondents' socio-economic characteristics, travel frequency, transport mode choice, commuting time, transportation challenges, awareness of environmental issues, and attitudes toward low-carbon transport alternatives such as public transportation, cycling, walking, and electric vehicles. To complement the questionnaire survey, field observations were conducted to assess traffic conditions, transportation infrastructure, and mobility patterns within the study area. Secondary data were obtained from relevant textbooks, scholarly journal articles, conference proceedings, government publications, transportation policy documents, and reports from international organizations such as the World Bank, United Nations Human Settlements Programme (UN-Habitat), and the International Energy Agency (IEA). These sources provided theoretical foundations and empirical evidence relating to urban mobility, sustainable transportation, and low-carbon development strategies.

To ensure the validity of the instrument, the questionnaire was reviewed by experts in transportation planning, urban development, and environmental management. Their comments and suggestions were incorporated into the final version of the instrument. Reliability was enhanced through a pilot survey conducted among a small group of respondents outside the selected sample areas. The pilot exercise helped identify ambiguities and improve the clarity of the questionnaire items before full-scale administration. The data collected were coded, organized, and analysed using descriptive statistical techniques. Frequencies, percentages, tables, and charts were employed to summarize and present the findings. The results were interpreted in line with the objectives of the study and discussed within the context of existing literature on urban mobility and sustainable transportation. Furthermore, each result was accompanied by detailed interpretation and policy implications to provide deeper insight into the transportation challenges facing Ibadan and the opportunities for adopting low-carbon transport solutions.

4.0 Results and Discussion

This section presents the analysis and discussion of data collected from one hundred and forty-five (145) respondents selected across various parts of Ibadan Metropolis. The findings are presented using frequency tables and percentages. The results are discussed extensively in relation to the objectives of the study and relevant literature on urban mobility and low-carbon transportation.

4.1 Socio-Economic Characteristics of Respondents

Table 1 presents the socio-economic characteristics of respondents. The results indicate that 82 respondents representing 56.6% were male, while 63 respondents representing 43.4% were female. This implies that both genders were adequately represented in the study, although males constituted a slightly higher proportion of

respondents. The age distribution reveals that respondents within the economically active age group dominated the sample. Specifically, 29.0% were between 18 and 25 years, 26.9% were between 26 and 35 years, while 21.4% were within the 36–45 years age category.

This reveals that the majority of respondents are active participants in urban transportation activities and depend heavily on mobility systems for employment, education, and commercial purposes. The findings indicate that transportation demand in Ibadan is largely driven by working-age individuals whose daily activities require frequent movement within the city. This pattern is consistent with the observations of Oyesiku (2002), who noted that urban transportation demand in Nigerian cities is strongly associated with economically active populations. The implication of this finding is that improvements in transportation systems can significantly influence economic productivity and social welfare. Efficient transportation infrastructure will not only reduce travel time but also improve access to employment opportunities and essential services.

Table 1: Socio-Economic Characteristics of Respondents (n = 145)

Variable	Category	Frequency	Percentage (%)
Gender	Male	82	56.6
	Female	63	43.4
	Total	145	100
Age	18–25	42	29.0
	26–35	39	26.9
	36–45	31	21.4
	46–55	20	13.8
	Above 55	13	8.9
	Total	145	100

Source: Author's Field Survey (2026)

4.2 Urban Mobility Patterns of Respondents

Results presented in Table 2 shows the dominant modes of transportation used by residents within Ibadan Metropolis. The results indicate that motorcycles accounted for the largest proportion of transportation modes, representing 28.3% of respondents. Commercial buses followed closely with 26.2%, while private cars accounted for 20.0%. The dominance of motorcycles and commercial buses demonstrates the importance of informal and semi-formal transportation systems in meeting urban mobility needs. These transport modes are often preferred because of their accessibility, affordability, and ability to navigate congested roads. Also, the high dependence on motorcycles is particularly noteworthy. Although motorcycles provide flexible mobility services, they are associated with numerous challenges including safety concerns, environmental pollution, and traffic management difficulties. Their extensive use also reflects inadequacies within the formal public transportation system.

The findings support previous studies by Ipingbemi (2010), who observed that commercial motorcycles play a significant role in urban transportation in southwestern Nigerian cities due to inadequate mass transit systems. Similarly, Oduwaye (2013) noted that informal transportation services continue to fill mobility gaps in rapidly

growing urban centres. The implication of these findings is that sustainable transportation policies should focus on improving public transportation systems while gradually reducing excessive dependence on motorcycles. Investment in efficient mass transit systems can improve mobility while simultaneously reducing congestion and greenhouse gas emissions.

Table 2: Primary Mode of Transportation Used by Respondents

Transport Mode	Frequency	Percentage (%)
Motorcycle (Okada)	41	28.3
Commercial Bus	38	26.2
Private Car	29	20.0
Tricycle (Keke)	21	14.5
Walking	9	6.2
Taxi/E-Hailing	7	4.8
Total	145	100

Source: Author's Field Survey (2026)

4.3 Average Daily Commuting Time

Table 3 reveals that 39.3% of respondents spend between 30 minutes and one hour commuting daily. Furthermore, 29.7% spend between one and two hours, while 11.7% spend more than two hours travelling. The findings indicate that many residents experience prolonged travel times due to traffic congestion, poor road conditions, and inadequate transportation infrastructure. Long commuting durations represent a significant burden on residents and may negatively affect productivity and quality of life. However, an extended travel times also have environmental implications. Vehicles operating for longer periods consume more fuel and generate higher levels of emissions. Consequently, inefficient mobility patterns contribute to increased greenhouse gas emissions and environmental degradation.

These findings align with those of Filani (1994), who identified traffic delays and congestion as major urban transportation challenges in Nigerian cities. The implication is that reducing travel time through improved infrastructure and efficient public transportation systems can enhance economic productivity while contributing to environmental sustainability.

Table 3: Average Daily Commuting Time of Respondents

Commuting Time	Frequency	Percentage (%)
Less than 30 Minutes	28	19.3
30 Minutes – 1 Hour	57	39.3
1–2 Hours	43	29.7
Above 2 Hours	17	11.7
Total	145	100

Source: Author's Field Survey (2026)

4.3 Transportation Challenges Affecting Urban Mobility

The results presented in Table 4 indicate that traffic congestion constitutes the most significant transportation challenge within Ibadan Metropolis, accounting for

35.9% of responses. Congestion has become a persistent feature of urban mobility due to increasing vehicle ownership, population growth, and inadequate road infrastructure. Thus, high transportation costs ranked second among identified challenges. Rising fuel prices and inflation have significantly increased transportation expenses, placing additional financial pressure on households. Poor road conditions were also identified as a major challenge. Deficiencies in road maintenance contribute to vehicle damage, increased travel time, and higher operating costs. The findings corroborate the observations of Akanmu, Gbadamosi & Omole (2022), who identified congestion and infrastructure deficiencies as major constraints to efficient urban mobility in Nigeria. The implication is that addressing transportation challenges requires integrated interventions involving road improvements, public transportation investments, and traffic management reforms.

Table 4: Major Transportation Challenges Experienced by Respondents

Challenge	Frequency	Percentage (%)
Traffic Congestion	52	35.9
High Transport Cost	34	23.4
Poor Road Conditions	28	19.3
Inadequate Public Transport	19	13.1
Safety Concerns	12	8.3
Total	145	100

Source: Author's Field Survey (2026)

4.4 Awareness and Perception of Low-Carbon Transport Solutions

Table 5 shows that 66.2% of respondents were aware of low-carbon transportation systems, while 33.8% indicated limited awareness. The findings suggest that discussions surrounding environmental sustainability and climate change have gained increasing prominence among urban residents. Growing public awareness may be attributed to media campaigns, educational initiatives, and global concerns regarding climate change. Despite this encouraging level of awareness, observations indicate that conventional transportation modes continue to dominate urban mobility patterns. This suggests that awareness alone is insufficient to drive behavioural change in the absence of supportive infrastructure and policies. The findings agree with Banister (2008), who argued that awareness is a critical prerequisite for sustainable transportation transitions. The implication is that policymakers should complement awareness campaigns with practical investments in sustainable transportation infrastructure.

Also, the results in Table 5 indicate that 74.5% of respondents expressed willingness to adopt low-carbon transportation alternatives if adequate infrastructure and affordable services are provided. This finding demonstrates a positive attitude toward sustainable transportation among residents. The willingness to embrace environmentally friendly transportation options reflects growing recognition of the environmental and economic challenges associated with current mobility systems. The findings support the position of UN-Habitat (2013), which emphasized that public acceptance is essential for successful implementation of sustainable urban transportation initiatives. The implication is that government investments in public

transportation, cycling infrastructure, and electric mobility technologies are likely to receive considerable public support.

Table 5: Awareness of Low-Carbon Transportation Solutions

Indicators	Awareness Level	Frequency	Percentage (%)
Awareness of Low-Carbon Transportation Solutions	Aware	96	66.2
	Not Aware	49	33.8
	Total	145	100
Willingness to shift to low carbon transport solution	Willing	108	74.5
	Not Willing	37	25.5
	Total	145	100

Source: Author's Field Survey (2026)

4.6 Preferred Policy Measures for Sustainable Urban Mobility

The findings in Table 6 reveal that improved public transportation systems represent the most preferred policy intervention among respondents. This indicates widespread dissatisfaction with existing transport services and highlights the need for efficient mass transit systems. Better road infrastructure ranked second, reflecting concerns regarding road quality and congestion. Respondents also expressed support for electric vehicle incentives and cycling infrastructure as strategies for promoting sustainable mobility. The findings suggest that residents recognize the importance of integrated transportation planning in addressing urban mobility challenges. Sustainable transportation cannot be achieved through isolated interventions but requires coordinated investments across multiple sectors. The implication is that policymakers should prioritize mass transit development, infrastructure upgrades, and environmentally friendly transportation technologies as part of broader sustainable urban development strategies.

Table 6: Preferred Policy Measures

Policy Measure	Frequency	Percentage (%)
Improved Public Transport	49	33.8
Better Road Infrastructure	37	25.5
Electric Vehicle Incentives	23	15.9
Cycling Facilities	20	13.8
Public Awareness Campaigns	16	11.0
Total	145	100

Source: Author's Field Survey (2026)

5.0 Conclusion and Recommendations

Urban transportation plays a vital role in promoting economic development, social interaction, and environmental sustainability within rapidly growing cities. As urban populations continue to increase, the demand for efficient, affordable, and environmentally sustainable transportation systems becomes increasingly important. This study examined urban mobility patterns and the prospects of low-carbon transport solutions for sustainable transportation in Ibadan Metropolis, Nigeria. The study was motivated by the growing concerns associated with traffic congestion, environmental

pollution, greenhouse gas emissions, and the inadequacy of transportation infrastructure in many Nigerian cities.

The findings revealed that urban mobility within Ibadan is largely dependent on road transportation, particularly motorcycles, commercial buses, tricycles, and private vehicles. Among these transport modes, motorcycles and commercial buses emerged as the most frequently used means of transportation due to their accessibility, flexibility, and ability to navigate congested road networks. While these transport modes play an important role in meeting the mobility needs of residents, they also contribute significantly to traffic congestion, environmental pollution, and road safety challenges. The study further established that a substantial proportion of residents spend considerable time commuting daily. Many respondents reported spending between thirty minutes and two hours travelling to their destinations. This finding highlights the growing transportation challenges associated with rapid urbanization, increasing travel demand, and inadequate transport infrastructure. Prolonged commuting periods not only reduce productivity but also increase fuel consumption, transportation costs, and greenhouse gas emissions.

Meanwhile, traffic congestion was identified as the most significant transportation challenge affecting residents of Ibadan Metropolis. Other major challenges include high transportation costs, poor road conditions, inadequate public transportation services, and safety concerns. These challenges collectively undermine the efficiency of urban mobility and negatively affect the quality of life of residents. The prevalence of these transportation problems demonstrates the urgent need for comprehensive transportation planning and infrastructure development within the metropolis. Also, the findings also revealed a relatively high level of awareness of low-carbon transportation among residents. A significant proportion of respondents indicated that they were familiar with the concept of environmentally sustainable transportation and understood the environmental implications of conventional transport systems. This suggests that public awareness regarding climate change, environmental sustainability, and transportation-related emissions is gradually increasing within the study area.

Furthermore, the study found that a large majority of respondents expressed willingness to adopt low-carbon transportation alternatives if appropriate infrastructure, supportive policies, and affordable services were provided. This finding is particularly encouraging because it demonstrates that residents are not resistant to sustainable transportation initiatives. Rather, the primary barriers to adoption appear to be inadequate infrastructure, limited investment, insufficient government support, and the absence of practical alternatives to conventional transportation systems. The study also revealed strong support for policy measures aimed at improving urban mobility and environmental sustainability. Respondents emphasized the need for improved public transportation systems, better road infrastructure, incentives for environmentally friendly transportation technologies, development of cycling facilities, and increased public awareness campaigns. These measures were perceived as essential for reducing congestion, improving mobility efficiency, and promoting sustainable transportation practices.

Based on the findings, it can be concluded that Ibadan possesses significant potential for the successful implementation of low-carbon transportation solutions. The existing level of public awareness and willingness to embrace sustainable mobility alternatives provides a favourable foundation for future transportation reforms. However, realizing this potential will require substantial investments in transportation infrastructure, policy support, technological innovation, and institutional capacity building.

The study therefore concludes that sustainable urban mobility in Ibadan cannot be achieved solely through road expansion or increased vehicle ownership. Instead, it requires a comprehensive approach that prioritizes efficient public transportation systems, non-motorized transport infrastructure, environmentally friendly technologies, and integrated urban planning strategies. Such an approach will not only improve mobility but also contribute to climate change mitigation, environmental protection, and sustainable urban development. Ultimately, the transition towards low-carbon transportation represents an important pathway for addressing the transportation challenges facing Ibadan while simultaneously advancing broader sustainability objectives. By investing in sustainable mobility systems today, policymakers can create a more efficient, inclusive, resilient, and environmentally sustainable transportation future for the city. As a result, the following recommendations are proposed:

i. First, there is a need for substantial investment in modern and efficient public transportation systems. The findings revealed heavy dependence on motorcycles and commercial buses due to the inadequacy of formal public transport services. Government agencies, private investors, and transportation authorities should collaborate to develop reliable mass transit systems capable of transporting large numbers of passengers efficiently. Such systems may include Bus Rapid Transit (BRT) services, modern urban buses, and rail-based transportation networks. Improved public transportation will reduce dependence on private vehicles and motorcycles while simultaneously lowering traffic congestion and greenhouse gas emissions.

ii. Second, government should prioritize the rehabilitation and expansion of transportation infrastructure within the metropolis. Poor road conditions were identified as a significant transportation challenge affecting mobility. Continuous maintenance of existing roads, construction of new road networks, and implementation of intelligent traffic management systems will improve traffic flow and reduce travel delays. Infrastructure improvements should also include the provision of pedestrian walkways, bus terminals, and designated transport corridors to support sustainable transportation systems.

iii. Third, policies that encourage the adoption of environmentally friendly transportation technologies should be introduced and strengthened. Government can provide incentives such as tax reductions, subsidies, and financial support for individuals and organizations interested in investing in electric vehicles and other low-emission transportation technologies. Such incentives would reduce the financial barriers associated with adopting sustainable transport alternatives and encourage wider acceptance of low-carbon mobility solutions.

iv. Fourth, there is a need to develop infrastructure that supports non-motorized transportation. Walking and cycling remain among the most environmentally sustainable modes of transportation, yet their adoption is constrained by inadequate facilities. The construction of dedicated bicycle lanes, pedestrian pathways, safe crossing points, and bicycle parking facilities will encourage residents to embrace active transportation for short-distance trips. In addition to reducing emissions, increased walking and cycling can improve public health and reduce transportation costs.

v. Fifth, environmental education and public awareness campaigns should be intensified. Although awareness of low-carbon transportation was relatively high among respondents, there remains a need to deepen public understanding of the environmental, economic, and social benefits associated with sustainable mobility. Government agencies, educational institutions, civil society organizations, and the media should collaborate to promote behavioural changes that support environmentally responsible transportation practices.

vi. Finally, further research should be conducted on emerging transportation technologies and sustainable mobility strategies within Nigerian cities. As urban populations continue to grow and transportation systems evolve, continuous research will be necessary to identify innovative solutions capable of addressing future mobility challenges. Future studies may focus on electric mobility adoption, smart transportation systems, transport-related carbon emissions, and the socio-economic impacts of sustainable transportation policies.

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