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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CHAPTER 24

URBAN ROAD TRAFFIC RESILIENCE AND SUSTAINABLE DEVELOPMENT IN IBADAN, NIGERIA

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Abstract

Rapid urbanization, increasing motorization, and growing travel demand have intensified traffic congestion in many Nigerian cities, creating significant challenges for sustainable urban development. This chapter examines the relationship between urban road traffic resilience and sustainable development in Ibadan, Nigeria. It identifies the drivers of congestion and proposes resilience-oriented mobility strategies. A descriptive case study approach was adopted, drawing on field observations, planning documents, government reports, the Ibadan Master Plan, and relevant scholarly literatures. The analysis was guided by the land-use–transport interaction framework, which explains the relationship among urban spatial structure, travel demand, and traffic conditions. The findings indicate that congestion in Ibadan is fundamentally a consequence of the interaction between rapid urban expansion, concentrated land-use activities, infrastructure limitations, public transport inefficiencies, poor parking management, encroachment of commercial activities on roadside, and weak traffic regulation enforcement. Major, congestion hotspots were identified along strategic corridors, including Iwo Road–Gate, Dugbe–Mokola, Challenge–Ring Road, and Ojoo–Sango among others. The study further reveals that persistent congestion reduces accessibility, increases transportation costs, contributes to environmental degradation, and constrains economic productivity, thereby undermining sustainable urban development objectives. Although road rehabilitation, traffic management initiatives, and public transport interventions have produced measurable improvements, their effectiveness remains constrained by underlying spatial and institutional challenges. The study concludes that achieving sustainable urban development in Ibadan requires a transition from reactive congestion management to integrated, resilience-oriented mobility planning. It argues that resilience-focused transport strategies are essential for improving accessibility, economic productivity, environmental quality, and urban liveability in rapidly growing African cities.

Keywords: Urban road traffic resilience; Sustainable urban development; Ibadan.

1.0 Introduction

Urban road traffic has become a major concern in contemporary urban development, particularly in rapidly growing cities where population increases; ill-planned, spatial expansion, motorization, and inadequate transport infrastructure interact to produce persistent congestion. Across the world, cities are expected to function as centers of economic production, social interaction, governance, innovation, and cultural exchange. However, the capacity of cities to perform these roles depends significantly on the efficiency, reliability, and resilience of their transport systems.

Where urban road networks are poorly planned, weakly managed, or overstretched by increase in travel demand, mobility becomes difficult, productivity declines and the quality of urban life is undermined. This explains why sustainable urban mobility is now widely recognized as a central component of resilient and inclusive urban development (UN-Habitat, 2022; World Bank, 2023).

In many African cities, road transport remains the dominant mode of passengers and freight movement. Yet urban growth has often outpaced the provision of adequate road infrastructure, public transport systems, traffic control facilities, and land-use management mechanisms. Mittal et al., (2023) observes that many African cities are expanding rapidly, but their mobility systems remain constrained by weak planning coordination, limited investment, inadequate public transport, and increasing dependence on informal and private modes of movement. These conditions have intensified congestion, increased travel time, raised transport costs, and worsened environmental problems such as air pollution and greenhouse gas emissions. Consequently, traffic congestion is not merely a transport problem it is also an economic, environmental, social, and governance challenge.

Meanwhile, Nigeria reflects many of these wider African urban mobility challenges. Major cities such as Lagos, Abuja, Port Harcourt, Kano, Enugu, and Ibadan experience increasing traffic pressure arising from rapid urbanization, rising vehicle ownership, informal public transport operations, poor road maintenance, roadside trading, illegal parking, and weak enforcement of traffic regulations (Akanmu & Salisu, 2024a; Gbadamosi & Akanmu, 2019). In such contexts, urban road traffic congestion affects daily commuting, business operations, emergency response, freight movement, public health, and environmental quality. The situation is further complicated by the limited integration of transport planning with land-use planning. Where residential, commercial, institutional, industrial, and recreational land uses are not properly coordinated with transport infrastructure, the result is often excessive travel demand, longer commuting distances, and traffic bottlenecks along major corridors.

Urban road traffic resilience refers to the capacity of a transport system to anticipate, absorb, adapt to, and recover from disruptions while maintaining acceptable levels of mobility, accessibility, safety, and service delivery. A resilient road traffic system is therefore not only one with expanded road capacity, but one supported by effective planning, maintenance, enforcement, public transport integration, data-driven traffic management, and institutional coordination (Akanmu & Salisu, 2025). Akanmu, Salisu, Gbadamosi & Sonde (2025) emphasizes that transport resilience requires proactive planning, risk-sensitive infrastructure management, reliable operations, and the ability to respond to shocks and stresses affecting mobility systems. For cities such as Ibadan, this means that traffic management should move beyond temporary congestion relief towards a broader strategy that supports sustainable urban development.

Despite the growing attention given to traffic congestion in Nigerian cities, many discussions still focus narrowly on road expansion, vehicle movement, or enforcement. Less attention is given to the broader resilience dimension of urban traffic systems and how traffic conditions influence sustainable development outcomes. In Ibadan, the challenge is not only that roads are congested, but that congestion reflects deeper issues

of urban form, land-use disorderliness, transport governance, infrastructure adequacy, environmental stress, and institutional coordination. Examining road traffic through the lens of resilience, therefore, provides a more comprehensive understanding of how mobility systems can support or constrain sustainable urban development.

Against this background, this study examines urban road traffic resilience and sustainable development in Ibadan, Nigeria. It discusses the prevailing traffic situation in the metropolis, identifies the major causes and effects of congestion, examines existing interventions, and proposes planning and management strategies for enhancing resilient urban road traffic.

2.0. Literature Review

The growing complexity of urban mobility has intensified scholarly interest in transport resilience and sustainable urban development. As cities continue to expand spatially and demographically, transport systems are increasingly required to support rising mobility levels while remaining efficient, safe, environmentally sustainable, and resilient to disruptions. Contemporary urban planning literature recognizes transport as more than a mobility service; it is a strategic component of economic productivity, social integration, environmental sustainability, and urban competitiveness. Consequently, cities with resilient transport systems are generally better positioned to sustain economic growth, improve accessibility, and enhance residents' quality of life (World Bank, 2023 & UN-Habitat, 2022).

Transport resilience has emerged as an important planning concept in response to increasing urban vulnerabilities stemming from population growth, infrastructure strain, climate-related hazards, energy disruptions, and governance challenges. The International Transport Forum (2024) views transport resilience as the capacity of transport systems to anticipate, absorb, adapt to, and recover from disruptions while maintaining acceptable levels of service. Earlier approaches to resilience focused primarily on the robustness of physical infrastructure. However, recent studies argue that resilience extends beyond infrastructure to include institutional effectiveness, governance capacity, operational flexibility, maintenance culture, emergency preparedness, and adaptive planning mechanisms. Jacyna-Gołda et al. (2026) contend that resilient transport systems require a combination of physical, organizational, and policy measures to maintain mobility under varying conditions. This broader understanding is particularly relevant to rapidly urbanizing cities in developing countries, where infrastructure deficiencies often interact with institutional limitations to create persistent mobility challenges (Figure 1).

Closely related to transport resilience is the concept of sustainable urban mobility. Sustainable mobility advocates transport systems that are accessible, affordable, safe, efficient, and environmentally responsible while supporting social equity and economic development (Akanmu, Gbadamosi & Omole (2022). Unlike traditional approaches that focus predominantly on road construction and traffic expansion, sustainable mobility emphasizes integrated transport planning, public transport enhancement, pedestrian infrastructure, cycling facilities, parking management, travel demand management, and land-use coordination. According to UN-Habitat (2022), sustainable mobility contributes significantly to achieving

inclusive, resilient, and productive cities by improving access to opportunities and reducing environmental impacts. Similarly, Akanmu & Salisu (2025) and Mavlutova et al. (2023) argued that sustainable mobility transitions require cities to shift from automobile dependency to integrated, multimodal transport systems capable of accommodating growing urban populations.

A fundamental issue in urban transport studies concerns the interaction between land use and transportation systems. According to Akanmu, Salisu & Sanni (2024), land use-transport relationship remains one of the most enduring themes in planning literature because urban activities generate travel demand while transport infrastructure influences the location, intensity, and distribution of those activities. Ewing and Cervero (2020) observe that urban form significantly influences travel behavior, trip generation, and traffic volume. Likewise, Roper (2024) maintained that inefficient coordination between land-use planning and transport planning frequently results in excessive travel demand, increased commuting distances, congestion, and reduced accessibility. The implication is that transport problems often originate not only from inadequate infrastructure but also from spatial development patterns that concentrate activities beyond the carrying capacity of existing transport systems.

This study is therefore anchored on the land–use–transport interaction perspective, which posits that urban land-use activities generate and attract movements while transport networks facilitate those movements across space. The framework suggests that residential, commercial, industrial, institutional, and recreational developments influence traffic demand, whereas transport accessibility influences subsequent development patterns. Consequently, congestion can be viewed as an outcome of the dynamic interaction between urban spatial structure and transport supply. This perspective is particularly relevant to Ibadan, where uncontrolled rapid urban expansion, mixed land-use development, and increasing dependence on road transport have intensified traffic pressures across major activity corridors. Across developing countries, traffic congestion has become one of the most visible manifestations of the imbalance between urban growth and transport capacity. The World Bank (2022) noted that many African cities experience chronic congestion due to rapid urbanization, inadequate infrastructure, weak transport governance, insufficient public transport services, and rising motorization. Studies have also identified poor road maintenance, illegal parking, roadside trading, ineffective traffic control systems, unregulated public transport operations, and weak enforcement of traffic regulations as contributors to congestion (Asimeng & Jauregui-Fung, 2025; Ikechukwu et al. 2025). These factors are often mutually reinforcing, producing mobility constraints that affect economic efficiency and urban functionality.

The consequences of traffic congestion extend far beyond delayed movements. Economically, congestion increases transportation costs, fuel consumption, freight delays, travel uncertainty, and productivity losses. Faheem et al. (2024) argued that persistent congestion reduces urban productivity by increasing the time and resources required to access employment centres, markets, institutions, and services. Socially, congestion contributes to stress, fatigue, reduced quality of life, and inequalities in accessibility, particularly among low-income populations that depend heavily on public transport. Environmentally, traffic congestion contributes significantly to greenhouse

gas emissions, air pollution, noise pollution, and urban environmental degradation. According to the World Bank (2023), improving urban mobility remains essential for achieving greener, more resilient, and more inclusive cities.

Meanwhile, substantial literature exists on sustainable mobility, urban congestion, and transport resilience, relatively limited attention has been devoted to examining urban road traffic resilience as a pathway to sustainable urban development in rapidly expanding secondary African cities. Much of the existing literature focuses on megacities such as Lagos, Nairobi, Johannesburg, and Cairo, while the experiences of large indigenous metropolitan centres such as Ibadan remain less explored. Given the city's rapid expansion, mixed land-use structure, increasing motorization, and strategic economic importance, there is a need to examine how resilient urban road traffic systems can contribute to sustainable development outcomes.

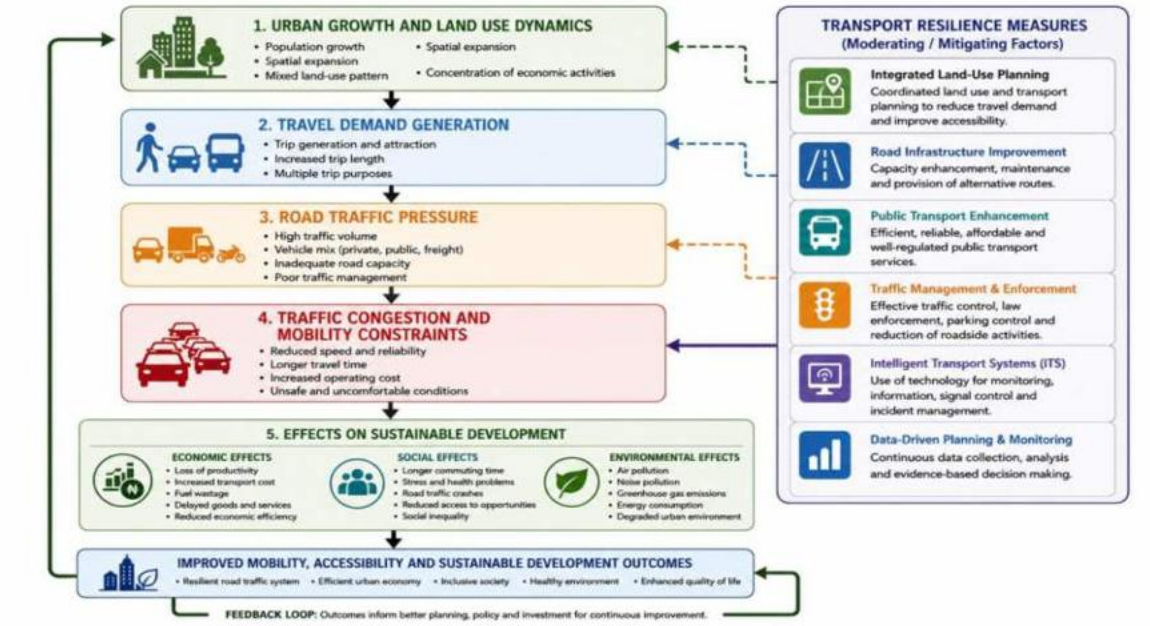


Figure 1: Conceptual Framework Linking Urban Road Traffic Resilience and Sustainable Development in Ibadan

Source: Authors' Conceptualisation (2026).

3.0 Materials and Methods

3.1 Study Area

The study was conducted in Ibadan Metropolitan Area, the capital city of Oyo State, and one of the largest indigenous cities in sub-Saharan Africa. Ibadan functions as a major administrative, commercial, educational, industrial, and transportation centre within southwestern Nigeria. Over the years, rapid population growth, urban expansion, increasing motorization, and changing land-use patterns have generated substantial

pressure on the city's transport infrastructure. Particular attention was given to major traffic corridors and activity centres, including Dugbe, Mokola, Gate, Iwo Road, Challenge, Bodija, Sango, Ojoo, Ring Road, Apata, and some other core areas (Figure 2). These corridors were purposively selected because they constitute the principal commercial, institutional, administrative, and transportation nodes within the metropolis and consistently experience high traffic volumes and recurrent congestion during peak travel periods.

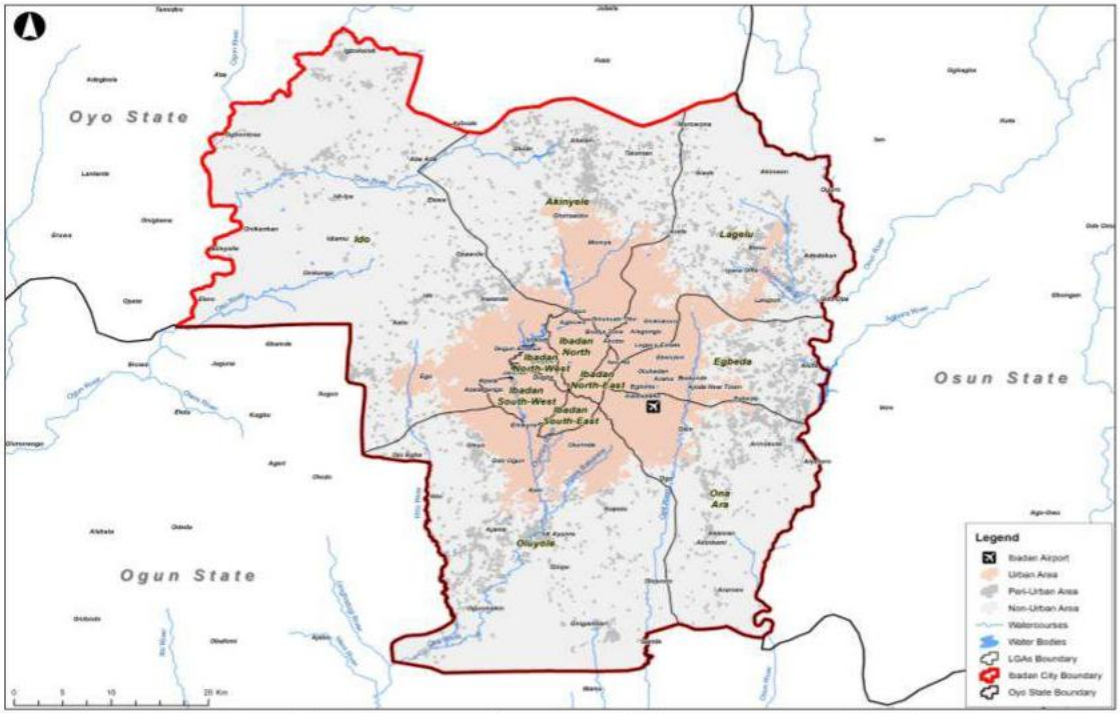


Figure 2: Location of Ibadan Metropolitan Area within Oyo State and Nigeria
Source: Ministry of Physical planning and Urban Development, Secretariat, Oyo State, 2025

3.2 Methodology

Data for the study were obtained from both primary and secondary sources. Primary information was generated through systematic field observations conducted across the selected corridors. The observations focused on traffic flow characteristics, roadway conditions, parking activities, roadside commercial activities, public transport operations, traffic control facilities, pedestrian movements, and major congestion points. These observations provided firsthand insights into the operational realities of road traffic within the metropolis. Secondary data were obtained from the Ibadan City Master Plan, government reports, policy documents, publications of transport-related agencies, and recent scholarly literature on transport resilience, sustainable mobility, urban congestion, and urban development. These sources provided valuable

information on urban growth patterns, transportation infrastructure, land-use structure, and existing traffic management interventions within the city.

The analysis was guided by the land-use–transport interaction framework, which posits that urban land-use activities generate travel demand, while transport systems facilitate and influence movement patterns and accessibility. Consequently, changes in urban spatial structure affect traffic volumes and mobility conditions, while transport infrastructure and accessibility influence subsequent development patterns. This framework provided the basis for understanding the relationship between urban growth, traffic congestion, and sustainable development within Ibadan.

The collected data was analyzed using qualitative content analysis and descriptive assessment techniques. Information obtained from field observations, planning documents, policy reports, and scholarly literature was systematically synthesized to identify prevailing traffic conditions, major congestion drivers, existing management interventions, and their implications for sustainable urban development. The analytical process focused on the interactions among land-use structure, transport demand, traffic management practices, and resilience-oriented interventions, with a view to proposing practical strategies to improve mobility, accessibility, and long-term sustainability within the Ibadan metropolitan area.

4.0 Results and Discussion

The findings indicate that urban road traffic within the Ibadan Metropolitan Area is strongly shaped by the interaction between land-use activities, urban growth, and transportation infrastructure. Figure 3 illustrates the major road network and traffic corridors within the metropolis, highlighting the concentration of traffic-generating activities along a limited number of arterial routes. As one of the largest metropolitan centers in southwestern Nigeria, Ibadan accommodates diverse commercial, institutional, industrial, administrative, recreational, and residential functions, generating substantial daily travel demand. The concentration of these activities within strategic corridors has produced pressure on the existing road network and other road transport, resulting in recurrent congestion across major parts of the city.

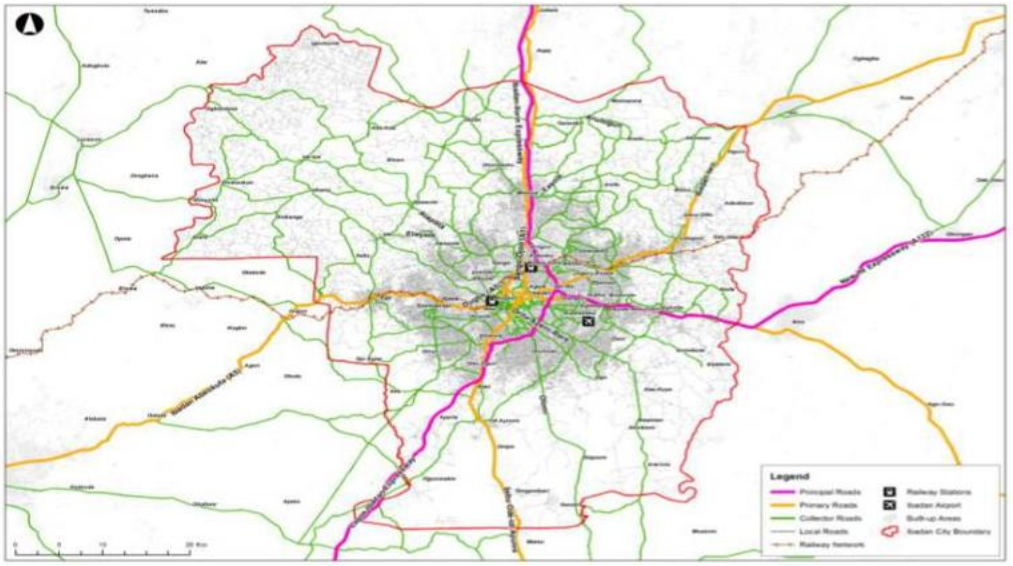


Figure 3: Major Road Network and Traffic Corridors in Ibadan Metropolitan Area
Source: Authors' Conceptualization &Ibadan City Master Plan, (2016)

Field observations revealed that congestion is most pronounced along the Iwo Road–Gate corridor, Dugbe–Mokola-Sango-UI-Ojoo axis, Challenge–Ring Road corridor, Bodija–Secretariat corridor, and Apata–New Garage route, particularly during weekday in the morning (7:00–10:00 a.m.) and evening (4:00–7:00 p.m.) peak periods. These corridors serve as major economic and transportation nodes that attract workers, students, traders, freight operators, and other road users from across the metropolis. Consequently, traffic volumes increased considerably during periods when residents commute between residential neighborhoods and major activity centers. These findings support the position of Ewing and Cervero (2020) that urban travel demand is largely influenced by the spatial distribution and intensity of land-use activities.

The observed traffic characteristics further demonstrate the influence of Ibadan's historical growth pattern on present-day mobility conditions. Majority of the city evolved organically without comprehensive transportation planning, resulting in irregular street layouts, narrow road corridors, mixed land-use development, and inadequate circulation space. While recent urban expansion has introduced more structured development patterns in some peripheral districts, many older areas continue to experience mobility constraints associated with inherited urban forms. This situation is particularly evident in traditional commercial districts as shown in Figure 4, where intense economic activity coexists with inadequate parking facilities, encroachment on road setbacks, and limited opportunities for road widening. Similar conditions have been reported in several rapidly urbanizing African cities where historical urban structures continue to challenge contemporary transportation management efforts (Asimeng & Jauregui-Fung 2025).



Figure 4: Typical Traffic Corridor in Dugbe, Ibadan
Source: Field Survey, 2025

The findings also indicate that rapid spatial expansion has increased traffic pressure within the metropolis. Residential development has progressively extended towards peripheral communities such as Moniya, Akobo, Alakia, Olorunsogo, Academy, Apata, Oluyole Extension, and other emerging growth areas. While these developments have accommodated increasing population growth, they have simultaneously increased commuting distances between places of residence and major employment, educational, commercial, and administrative centres. Consequently, large volumes of daily trips are routed through a limited number of arterial roads that link the urban fringe to the city centre. The resulting pressure contributes to recurring congestion and longer travel times, thereby reducing the efficiency of urban mobility and undermining accessibility.

A major finding of this study is that traffic congestion in Ibadan is not merely a function of increasing vehicle ownership but is largely associated with the concentration of land-use activities within a limited number of strategic locations. Commercial centres such as Dugbe, Bodija, Gate, Mokola, Iwo Road, and Challenge continue to attract substantial volumes of vehicular and pedestrian traffic daily. Similarly, major educational institutions, government offices, healthcare facilities, and markets generate significant travel demand that frequently exceeds available road capacity. This observation supports Roper (2024) argument that congestion is often a manifestation of spatial planning deficiencies rather than solely a transportation infrastructure problem. The implication is that sustainable traffic management cannot be achieved through road expansion alone without addressing the spatial distribution of urban activities.

Poor road conditions were also identified as an important contributor to traffic congestion in parts of the metropolis. Although recent government interventions have improved some arterial roads, many secondary and collector roads (e.g. Agugu-Odeaje, Ojagbo-Kosodo-Labo, Oranyan-Kobomoje-Idi-Arere road) continue to experience

pavement deterioration, potholes, drainage deficiencies, and surface failures. These conditions reduce traffic speed, increase travel delays, and constrain the operational efficiency of the road network. More importantly, they increase vehicle operating costs and discourage efficient movements between neighborhoods and activity centres. This finding suggests that road rehabilitation programs must be complemented by regular maintenance strategies to achieve long-term traffic resilience.

Public transport operations constitute another significant factor influencing traffic conditions within Ibadan. Observations indicate that commercial buses, taxis, tricycles, and motorcycles frequently stop at undesignated locations to load and offload passengers. Such practices reduce roadway capacity and create interruptions to traffic flow, particularly along heavily traveled corridors (e.g. Beere-Orannyan road; Beere-Oritamerin road etc). The challenge is compounded by the inadequate provision of formal bus stops, passenger terminals, and dedicated public transport infrastructure. Similar observations have been documented across many African cities where weak regulation of public transport systems contributes to congestion and mobility inefficiencies (Mittal et al., 2023). This finding highlights the need for stronger integration between public transport planning and urban traffic management.

Roadside trading and indiscriminate parking were also found to contribute significantly to congestion in major commercial districts. In areas such as Dugbe, Bodija, Gate, Agbeni, Ogunpa, Oke padre and parts of Iwo Road, commercial activities frequently extend onto road shoulders and pedestrian walkways, thereby reducing the effective width of roads and creating conflicts between vehicular and pedestrian movements. Similarly, on-street parking occupies valuable road space and restricts traffic circulation. Beyond their traffic implications, these activities reduce environmental quality, increase safety risks, and undermine efforts towards sustainable urban development.

The study further revealed that weaknesses in traffic regulation and enforcement continue to affect mobility efficiency within the metropolis. Despite the efforts of traffic management agencies, incidents of illegal parking, indiscriminate stopping, route violations, wrong-way driving, and non-compliance with traffic regulations remain evident across several corridors. Contemporary transport governance literature emphasizes that sustainable traffic management depends not only on infrastructure provision, but also on effective institutional coordination, enforcement mechanisms, and behavioural compliance among road users (International Transport Forum, 2024). Consequently, the persistence of these practices suggests the need for stronger regulatory enforcement and public education programs.

Overall, the findings demonstrate that traffic congestion in Ibadan results from the combined effects of rapid urban growth, concentrated land-use activities, infrastructure limitations, inadequate public transport management, roadside commercial encroachment, insufficient parking control, and weak regulatory enforcement. These factors interact to reduce mobility efficiency, increase travel costs, and constrain economic productivity. More importantly, they undermine broader sustainable development objectives by limiting accessibility, increasing environmental pressures, and reducing the overall functionality of the urban transport system. The findings therefore reinforce the argument that improving traffic conditions in Ibadan

requires integrated interventions that simultaneously address land-use planning, transport infrastructure, traffic management, institutional governance, and urban development policy.

The findings therefore support the argument that transportation efficiency remains a critical determinant of urban competitiveness and economic vitality. The economic consequences of congestion are further reflected in rising transportation costs. Prolong travel time, increased fuel consumption, and frequent vehicle wear and tear impose additional financial burdens on both transport operators and commuters. These costs are often passed on to consumers through higher transport fares and higher prices for goods and services. Such conditions disproportionately affect low-income households that rely heavily on public transportation for daily mobility. Consequently, traffic congestion contributes not only to economic inefficiency but also to social inequality by limiting affordable access to employment opportunities, education, healthcare services, and other urban facilities. The findings also revealed important environmental implications. Persistent traffic congestion increases vehicular emissions, air pollution, and noise levels, particularly along heavily traveled corridors and major commercial centres. Slow-moving traffic and prolonged vehicle idling contribute to higher concentrations of pollutants that pose risks to both environmental quality and public health. This observation is consistent with contemporary sustainable mobility literature, which identifies urban transportation as a major contributor to environmental degradation in rapidly urbanizing cities. The environmental costs of congestion, therefore, extend beyond transportation itself and influence broader urban sustainability outcomes.

From a social perspective, congestion contributes to stress, fatigue, and reduced quality of life among urban residents. Prolonged travel delays reduce the time available for productive, recreational, and family activities. The resulting decline in personal well-being represents an often-overlooked dimension of urban traffic problems. Furthermore, congestion affects the efficiency of emergency response services, public transportation operations, and access to essential urban functions. These impacts highlight the interconnected relationship between transportation systems, and the overall functionality of urban environments. The findings further suggest that traffic congestion in Ibadan represents as much of an accessibility challenge rather than as a mobility challenge. While mobility refers to the movement of people and vehicles, accessibility concerns the ease with which residents can reach opportunities and services. The concentration of traffic-generating activities within a limited number of corridors has created situations in which physical movement is still possible but increasingly inefficient. Consequently, access to employment centres, educational institutions, healthcare facilities, and markets is constrained despite the presence of transport infrastructure. This reinforces the argument that sustainable urban development depends not merely on expanding road capacity, but on improving the effectiveness and reliability of urban accessibility systems.



Figure 5: Aerial view of Ibadan Inner Core
Source: Field Survey, 2025

In response to these challenges, various interventions have been implemented by government agencies over the years. These include road rehabilitation programs, road expansion projects, junction improvements, flyover construction, traffic control measures, and the introduction of mass transit initiatives. Investments in strategic corridors such as the Dugbe–Eleyele route, dualization Gate–Sawmill corridor, Airport Road, (Junction Improvement) and Idi-Ape–Akobo route have contributed to improved traffic circulation in some locations. Similarly, the establishment of modern motor parks and the operation of public transport constitute transport company fleets schemes demonstrate growing recognition of transportation as a critical component of urban development. Institutional interventions have also played important roles in traffic management. Agencies such as the Federal Road Safety Corps (FRSC), Oyo State Road Traffic Management Authority (OYRTMA), and Vehicle Inspection Services continue to regulate traffic operations, enforce road safety measures, and respond to traffic incidents. These institutions have helped reduce operational disruptions and improve compliance with traffic regulations. Nevertheless, the persistence of congestion across major corridors suggests that institutional efforts alone have not been sufficient to address the underlying structural causes of traffic problems.

A critical examination of existing interventions reveals that many have focused predominantly on increasing road capacity through physical infrastructure development. While such investments remain important, the findings indicate that congestion in Ibadan is a fundamentally linked to broader issue of land-use concentration, urban growth, parking management, public transport organization, roadside commercial activities, and travel behavior. This suggests that infrastructure expansion alone cannot provide a sustainable solution to urban traffic challenges. Similar conclusions have been reached in contemporary urban transport studies, which increasingly advocate integrated approaches that combine transportation planning with land-use management and governance reforms.

The findings, therefore, pointed towards the importance of urban road traffic resilience as a framework for achieving sustainable mobility. Resilience-oriented traffic management recognizes that transport systems must not only accommodate current travel demand but also adapt to future demographic, economic, environmental, and technological changes. In the context of Ibadan, resilience requires coordinated planning that integrates transportation infrastructure with urban development policies, promotes efficient public transport systems, strengthens traffic regulation, and improves institutional collaboration. Such an approach would enhance the urban transport system's capacity to absorb disruptions while maintaining acceptable levels of accessibility and service delivery.

The results indicate that the long-term sustainability of Ibadan's transportation system depends on moving beyond reactive congestion management to proactive, integrated mobility planning. Improving road traffic resilience would not only enhance movement efficiency but would also strengthen economic productivity, environmental sustainability, social inclusion, and urban livability. Consequently, transport planning should be viewed as a central component of sustainable urban development rather than merely an engineering response to traffic congestion.

5.0 Conclusion and Recommendations

This study examined urban road traffic resilience and sustainable development in Ibadan, Nigeria, against the backdrop of increasing urbanization, expanding travel demand, and growing pressure on transportation infrastructure. The findings demonstrate that traffic congestion within the metropolis is fundamentally a product of the interaction between rapid urban growth, concentrated land-use activities, infrastructure limitations, public transport inefficiencies, weak traffic management practices, and institutional challenges. The concentration of major commercial, administrative, educational, and residential activities along selected strategic corridors has intensified traffic pressure and contributed to persistent congestion across key parts of the city (see figure 5).

The study further revealed that the consequences of congestion extend far beyond transportation inefficiencies. Persistent traffic delays, rising transportation costs, declining accessibility, environmental pollution, and reduced mobility reliability collectively affect economic productivity, social well-being, and environmental sustainability. These impacts underscore the central role of transportation systems in shaping urban development outcomes and reinforce the view that mobility challenges should be approached as broader planning and governance concerns rather than purely engineering problems. Collectively, the findings demonstrate that traffic congestion in Ibadan is not merely a transport issue but an urban development challenge with significant implications for the long-term sustainability and functionality of the metropolis. Although considerable investments have been made in road rehabilitation, road expansion, traffic management operations, and public transport initiatives, the persistence of congestion suggests that infrastructure-focused interventions alone are insufficient. Sustainable improvements in urban mobility require a more integrated approach that addresses the underlying spatial, institutional, and behavioral factors influencing traffic conditions. In this regard, urban road traffic resilience provides an appropriate framework for understanding how transportation systems can maintain functionality, adapt to changing conditions, and support sustainable urban development amid ongoing urban growth.

Based on the findings, three broad areas of intervention are considered essential. First, planning interventions should strengthen the integration of land-use planning and transportation planning to ensure that future urban growth occurs in ways that promote accessibility reduce unnecessary travel demand, and support balanced spatial development. Second, infrastructure and mobility interventions should prioritize regular road maintenance, improved public transport services, modern passenger facilities, intelligent traffic management systems, and data-driven monitoring mechanisms to enhance operational efficiency. Third, governance interventions should focus on strengthening regulatory enforcement, improving institutional coordination among transport-related agencies, promoting traffic education, through Special Marshal of FRSC; Traffic Marshal of the OYRTMA, and ensuring greater compliance with traffic regulations and urban development controls. Achieving sustainable urban development in Ibadan requires a transition from reactive congestion management towards proactive, integrated, and resilience-oriented mobility planning. Such a transition will not only improve traffic flow and accessibility but will also enhance economic productivity,

environmental quality, social inclusion, and urban liveability. The study, therefore, concludes that the resilience of Ibadan's transport system will play a decisive role in determining the city's capacity to remain economically productive, environmentally sustainable, socially inclusive, and spatially functional amid ongoing urban growth and development pressures.

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