Overcoming resistance to sustainable urban transportation adoption in Sub-Saharan African cities: qualitative insights from Lagos and Johannesburg

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Abstract. Rapid urbanization across Sub-Saharan Africa (SSA) has intensified transport challenges, including congestion, environmental degradation, and road safety concerns. Sustainable Urban Transport (SUT) has been widely promoted as a strategy to address these issues; however, its adoption remains limited in many African cities. This study explores the factors contributing to resistance toward SUT adoption and identifies strategies that may facilitate its implementation. Using a qualitative research design, semi-structured interviews were conducted with nine experts involved in transport planning, policy development, and sustainable mobility initiatives in Lagos (Nigeria) and Johannesburg (South Africa). The data were analyzed using thematic analysis. The findings reveal five major themes shaping resistance to SUT adoption: structural and institutional constraints, transport system limitations and infrastructure gaps, socio-cultural perceptions and behavioural resistance, urban inequality and mobility justice concerns, and pathways for overcoming resistance. The results highlight the complex interplay between governance structures, infrastructure deficits, behavioural attitudes, and socio-economic inequalities in shaping mobility transitions. The study contributes to sustainable transport literature by integrating behavioural and socio-technical perspectives to propose a framework for overcoming resistance to SUT adoption in SSA cities.

1 Introduction

Urbanization in SSA has exacerbated urban mobility issues, such as congestion, transportation emissions, road safety risks, and an increasing reliance on private automobiles and informal transport networks [1]. SUT, which promotes public transport, non-motorized mobility, and inclusive accessibility, has emerged as à key strategy for addressing such challenges. However, the adoption of sustainable mobility initiatives in many African cities remains constrained by governance fragmentation, inadequate infrastructure, financial limitations, and socio-economic inequalities [2]. In cities such as Lagos and Johannesburg, inadequate and poorly integrated transport systems continue to reinforce private vehicle dependence, while informal and under-resourced public transport networks limit reliable mobility access [3]. Addressing these challenges require integrated and context-specific transport planning approaches that improve accessibility while supporting sustainable mobility transitions. Non-motorized transport, such as walking and cycling, continues to play an important role in mobility systems across SSA cities, although its use is often driven by economic necessity rather than preference. Enhancing infrastructure for pedestrians and cyclists, improving safety for vulnerable road users, and strengthening institutional capacity for implementing active mobility policies are therefore essential for promoting sustainable transport transitions [4][1]. At the same time, paratransit services—commonly provided through privately operated minibuses—remain a central component of urban mobility systems across the region. These services fill critical gaps within formal transport networks and may contribute to sustainable mobility transitions if effectively regulated and integrated into formal transport planning processes [4]. Despite these opportunities, rising automobile dependency continues to exacerbate congestion, environmental pollution, and inefficiencies within urban mobility systems, highlighting the need for coordinated policy interventions and infrastructure investments aimed at encouraging sustainable travel behaviour [5].

Transport behaviour also plays a crucial role in shaping the adoption of sustainable mobility systems. The theory of planned behaviour (TPB) suggests that individuals' transport choices are influenced by attitudes toward behaviour, perceived social norms, and perceived behavioural control. This theoretical perspective has been widely applied to understand travel mode choice and mobility behaviour across different contexts. Research indicates that social norms, perceived convenience, and symbolic values associated with car ownership can significantly influence individuals' willingness to adopt sustainable transport alternatives [6]. Perceptions related to safety, reliability,

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and accessibility further influence behavioural intentions regarding the use of public transport or non-motorized travel modes. Behavioural science research also demonstrates that targeted interventions can influence transport choices. Strategies such as social norms, visualization, and focalism have been shown to increase individuals' willingness to adopt sustainable commuting options such as walking and cycling [7], while behavioural nudges can encourage commuters to shift away from single-occupancy vehicle use toward more sustainable alternatives. Frameworks such as the DRIVE process—which involves defining behavioural problems, researching travel behaviour, implementing interventions, verifying impacts, and evaluating outcomes—have been proposed as structured approaches for promoting transport behaviour change [8]. These findings highlight that sustainable mobility transitions depend not only on infrastructure provision but also on social and psychological factors influencing travel behaviour.

In addition to behavioural influences, sustainable mobility transitions are shaped by broader socio-technical dynamics involving technological innovations, institutional structures, policy frameworks, and cultural practices. Socio-technical transition theory explains how changes in mobility systems occur across multiple levels, including micro-level innovations, meso-level transformations within existing transport regimes, and macro-level socio-economic conditions that shape mobility trends. Research in Brazil illustrates how limited integration between transport modes and alternative fuels at the micro level, competition between car-oriented systems and public transport regimes at the meso level, and broader socio-economic contexts at the macro level influence urban mobility transitions [9]. Emerging innovations, such as shared mobility services including car-sharing and bike-sharing schemes, have also been identified as potential contributors to sustainable mobility transitions by providing alternatives to private vehicle ownership, although their impacts vary across different contexts [10]. In some cities, mobility transitions occur through improvements within existing public transport systems rather than through entirely new innovations, demonstrating that transition pathways are often shaped by local institutional and infrastructural conditions [11].

Another important dimension of sustainable mobility transitions relates to issues of mobility justice and transport inequality. Access to transportation systems is often unevenly distributed across urban populations, with marginalized communities frequently experiencing reduced access to reliable and affordable mobility services. These inequalities are closely linked to broader socio-economic factors such as income, gender, age, disability, and ethnicity, which influence individuals' ability to access employment, education, and healthcare [12]. In many urban contexts, transportation systems tend to favour wealthier populations—sometimes referred to as the "kinetic elite"—who possess greater mobility options, while disadvantaged communities face significant barriers to mobility access [12]. The mobility justice framework, therefore, advocates for more equitable transportation systems that address both distributive and procedural justice in transportation planning while also recognizing spatial inequalities in mobility access.

These challenges are particularly significant for vulnerable populations such as persons with disabilities, whose mobility barriers are often shaped by social and institutional constraints rather than purely technical limitations [13]. Efforts to promote environmentally sustainable transport may also create tensions between environmental and social justice if policies inadvertently reduce access to affordable mobility options. As a result, policymakers and grassroots movements increasingly advocate for inclusive transport planning approaches that address transport inequality while supporting sustainable mobility transitions [12].

Within this broader context, cities such as Lagos and Johannesburg provide particularly important case studies for examining sustainable transport transitions in SSA. Both cities are major economic centres experiencing rapid urban growth and significant mobility challenges, including congestion, inadequate transport infrastructure, and spatial inequalities in mobility access. In recent years, several sustainable mobility initiatives have been introduced in these cities, including Bus Rapid Transit (BRT) systems, rail upgrades, and policies aimed at improving non-motorized transport infrastructure. Despite these initiatives, resistance to sustainable urban transport adoption remains evident among both institutional stakeholders and urban residents. In Lagos, for example, efforts to expand public transport systems have encountered challenges related to the dominance of informal transport systems and regulatory complexities [14].

Drawing from the reviewed literature, Fig. 1 presents a thematic synthesis of the key dimensions contributing to resistance toward SUT adoption in SSA cities. This thematic map guided the analytical framing of this study and informed the development of the interview themes explored in the findings section.

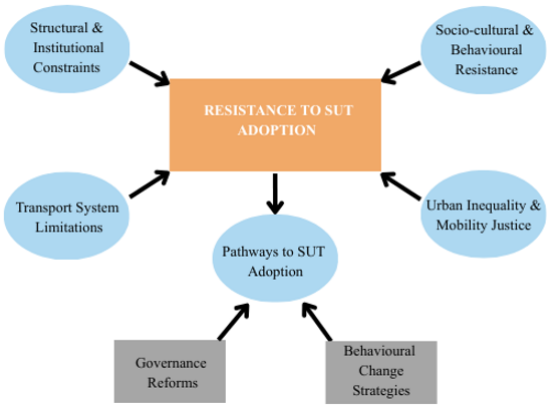

Fig. 1. Thematic map of resistance to sustainable urban transport adoption.

Existing studies on sustainable urban transport in SSA have primarily focused on infrastructure development, policy frameworks, and technological interventions. However, limited research has examined how stakeholder perceptions, socio-cultural attitudes,

behavioural resistance, and mobility justice concerns interact to influence resistance toward SUT adoption. Furthermore, few comparative qualitative studies have explored these dynamics across different African urban contexts, such as Lagos and Johannesburg. Understanding these perspectives is important because the success of sustainable mobility policies depends not only on infrastructure investments but also on institutional support, public acceptance, and behavioural change. Consequently, it is necessary to examine what factors contribute to resistance toward the adoption of sustainable urban transport systems in SSA cities, and how these barriers can be addressed to improve implementation and public acceptance. The objectives explored in addressing this question are the following:

1. To identify the structural, institutional, and behavioural factors influencing resistance to Sustainable Urban Transport adoption.
2. To explore stakeholder perceptions and experiences regarding sustainable mobility initiatives in African cities.
3. To examine socio-cultural and governance challenges affecting the implementation of sustainable transport systems.
4. To propose context-specific strategies that could enhance acceptance and implementation of sustainable urban mobility solutions.

2 Methods

This study adopted a qualitative, interpretivist research design to explore stakeholder perspectives on resistance to SUT adoption in SSA. The interpretivist approach is appropriate as it seeks to understand how individuals interpret and make sense of social phenomena within their specific contexts, particularly in relation to urban mobility transitions shaped by institutional, infrastructural, and socio-cultural dynamics. Lagos and Johannesburg were selected as case study cities due to their prominence as major metropolitan hubs facing significant mobility challenges associated with rapid urbanization. Lagos is characterized by high population density, congestion, and reliance on informal transport systems, while Johannesburg reflects a contrasting context shaped by historical spatial inequalities, car dependency, and uneven access to public transport.

Data were collected through semi-structured interviews with nine purposively selected experts involved in urban transport planning, policy, and sustainable mobility initiatives. The sample size of nine participants was considered appropriate for this qualitative exploratory study because the research focused on obtaining in-depth expert insights rather than statistical generalization. Qualitative research emphasizes richness of data, contextual understanding, and thematic saturation, particularly when participants possess specialized expertise relevant to the research phenomenon [15]. The selected participants represented diverse professional perspectives across transport planning, policy, infrastructure, sustainability, and mobility governance in both cities. Each interview lasted approximately 30–45 minutes and followed a flexible guide covering key topics such as perceptions of SUT, mobility challenges, governance barriers, behavioural influences, and strategies for improving sustainable transport adoption. Ethical access to participants was obtained through formal institutional permissions.

The interview data were analyzed using reflexive thematic analysis following the framework developed by Braun and Clarke [15], involving iterative stages of familiarization, coding, theme development, and refinement. This process resulted in the identification of five key themes explaining resistance to SUT adoption and potential pathways for addressing these barriers.

A reflexive approach was maintained throughout the analysis to ensure that interpretations remained grounded in participant perspectives, with direct excerpts used to enhance credibility and authenticity. The diversity of participants ensured a wide range of expert insights across both cities, as summarized in Table 1.

Table 1. Description of interview participants.

Participant code	Professional role	Area of expertise	City context
P1	Road & Infrastructure Specialist	Infrastructural Planning for Public Transport	Lagos
P2	Senior Specialist in Rail Design	Public Transport	Lagos
P3	Transport Planning Professional	Transport Planning and Policy	Lagos
P4	Public Bus Operations Management Specialist	E-mobility and Bus Operations	Lagos
P5	Social Specialist in Safety	Social Safeguards	Lagos
P6	Transport Analyst/ Economist	Transport Planning and Assessment	Lagos
P7	Transport Systems Analyst/ Researcher	Traffic Engineering and Transport Planning	Johannesburg
P8	Sustainable Mobility Consultant/ Researcher	Road Safety and e-mobility Initiatives	Johannesburg
P9	Urban Sustainability Initiator	Sustainable Mobility Transitions	Johannesburg

3 Results and discussion

3.1 Thematic framework

The framework organizes the findings into five overarching themes, described in Table 2. These themes capture the primary factors influencing resistance to the adoption of sustainable urban transport in Lagos and

Johannesburg. These themes include structural and institutional constraints, transport system limitations and infrastructure gaps, socio-cultural perceptions and behavioural resistance, urban inequality and mobility justice, and potential pathways for advancing sustainable transport adoption. Together, the framework provides a structured overview of how governance challenges, infrastructure limitations, behavioural attitudes, and socio-economic factors interact to shape resistance to sustainable mobility initiatives in Sub-Saharan metropolitan African cities.

Table 2. Themes identified in the sustainable urban transport survey.

Themes	Description
Structural and Institutional Constraints	Governance, policy enforcement, and institutional coordination challenges affecting sustainable urban transportation (SUT) implementation
Transport System Limitations	Infrastructure deficiencies and operational inefficiencies limiting sustainable mobility options
Socio-Cultural Perceptions and Behavioural Resistance	Public attitudes, social norms, and behavioural factors discouraging SUT use
Urban Inequality and Mobility Justice	Accessibility and affordability challenges affecting marginalized populations
Pathways for Advancing Sustainable Urban Transport Adoption	Policy, technological, and community-based strategies for advancing SUT adoption

3.1.1 Structural and institutional constraints

A dominant theme across the interviews was the role of institutional and governance challenges in limiting the adoption of sustainable transport initiatives. Participants emphasized that, although policies supporting sustainable mobility often exist, their implementation remains inconsistent. One respondent echoed this view when they said, "sometimes you know policies exist, but enforcement is weak, so people don't follow them." Another participant observed the symbolic nature of certain transport policies by saying, "the city might plan for HOV (high occupancy vehicles) lanes, but without enforcement, it's just signs on the road." These opinions illustrate the gap between policy design and implementation, which contributes to public scepticism toward sustainable mobility initiatives.

Transport planning responsibilities are distributed across multiple government agencies often with limited coordination. Hence institutional fragmentation emerged as another significant barrier to SUT. Like a participant said: "Different government departments don't talk to each other, which makes projects slow." From a techno-social transition perspective, such governance fragmentation creates institutional inertia that slows sustainable mobility transformation.

Another constraint identified by participants is perceived lack of funding for SUT implementation. One interviewee remarked: "There's a huge lack of funding for public transport expansion." These indicate that strengthening institutional coordination and enforcement mechanisms is critical for overcoming resistance to sustainable transport adoption.

3.1.2 Transport system and infrastructural inadequacy

Transport infrastructure deficiency was another key theme emerging from the interviews. Although expressed differently, participants affirmed the unreliability and poor integration of existing transportation systems both Lagos and Johannesburg. One respondent remarked that, "Trains don't run on time, and buses aren't coordinated." While another respondent said, "I avoid buses because they are unpredictable and often overcrowded." Such operational inadequacy and discomfort undermine public confidence in sustainable transport and encourage the continued reliance on private alternatives.

Participants noted the absence of the integration between formal and informal transport systems. Regarding this, an interviewee said, "Formal buses and informal taxis rarely coordinate, making transfers difficult." Such fragmentation limits the effectiveness of multimodal transport systems and creates inefficiencies for commuters. However, this trend of infrastructural deficiency, unreliable transport systems and weak modal integration have been observed in many other SSA cities, resulting in poor public confidence in sustainable mobility initiatives [3]. As one participant mentioned, "Sidewalks are narrow and unsafe; cycling lanes are tokenistic." Such inadequate infrastructure for walking and cycling further discourages sustainable mobility. These findings highlight the importance of improving infrastructure quality and connectivity to encourage sustainable transport adoption.

3.1.3 Socio-cultural perceptions and behavioural resistance

Beyond structural barriers, socio-cultural attitudes and behavioural patterns also influence resistance to sustainable transport adoption. From the interview, participants highlighted widespread negative perceptions of public transport. One respondent mentioned that "People think public transport is dangerous and unreliable." Another participant noted the social stigma associated with the use of public transport in saying, "There's a stigma; people avoid trains and buses even if they work." Participants also emphasized the status associated with private car ownership. One respondent explained: "Car ownership is linked to status, making it hard to shift behaviours.". Such cultural perceptions reinforce resistance to sustainable mobility alternatives. So, even if efficient, safe and affordable sustainable transport options were available, this mindset will hinder SUT adoption. These perceptions—particularly the roles of attitudes,

subjective norms, and perceived behavioural control—shape transport behaviour. This aligns with the theory of planned behaviour, which suggests that attitudes and social norms strongly influence behavioural intentions. Negative perceptions regarding safety and reliability contribute to unfavourable attitudes toward public transport, while the symbolic status associated with car ownership reinforces social norms supporting private vehicle use. Addressing these behavioural barriers may therefore require targeted public awareness campaigns and incentives that encourage sustainable transport use.

3.1.4 Urban inequality and mobility justice

Transport affordability emerged as another primary concern. One participant noted, "Public transport is expensive relative to wages." In the South African context, historical urban planning patterns drive these high costs, with one interviewee explaining, "Apartheid-era planning still dictates who can move freely." Participants highlighted how the spatial distribution of employment and housing in many African cities forces peripheral residents to travel long distances for economic opportunities. Consequently, urban inequality significantly shapes resistance to sustainable mobility initiatives, as a respondent explained: "People in township areas cannot easily access jobs or services."

Consistent with the findings of [12], these results highlight mobility injustice, particularly regarding unequal access to affordable and reliable transportation for marginalized populations. This demonstrates that transport inequalities are deeply intertwined with broader spatial and socio-economic exclusion patterns within metropolitan areas. This is especially evident in cities like Johannesburg, where apartheid spatial planning continues to entrench transport disparities and unequal mobility access. These findings highlight the importance of mobility justice in sustainable transport planning and adoption.

3.2 Pathways to overcoming resistance to SUT adoption

Despite these barriers, participants proposed several strategies to accelerate the adoption of sustainable urban transport systems. Policy reforms emerged as a critical component; for instance, one participant suggested that "congestion charges or HOV lanes could incentivize public transport use."

Technological innovation was also highlighted as a key enabler. One respondent noted that "apps could integrate informal and formal transport." Given the ubiquitous use of smartphones, digital integration could significantly boost the acceptance of sustainable transport by granting commuters greater control over their personal mobility and easing navigation between different transit modes.

Furthermore, community participation initiatives were identified as vital drivers of attitudinal change, with one participant noting that "community participation can drive real change." Collectively, these findings suggest that overcoming resistance to sustainable transport requires a multidimensional approach that successfully integrates governance reforms, infrastructure upgrades, technological innovation, and behavioural change initiatives.

3.3 Comparative insights: Lagos and Johannesburg

Although the themes identified in the study were broadly consistent across both cities, the interviews revealed several contextual differences in how resistance to SUT adoption manifests in Lagos and Johannesburg. While both cities experience governance challenges, infrastructure limitations, and behavioural resistance, the nature and intensity of these barriers vary according to local institutional and socio-economic contexts.

Participants noted that Lagos faces stronger challenges related to informal transport dominance and infrastructure deficits, whereas Johannesburg's challenges are more closely associated with spatial inequality and historical urban planning patterns.

The comparison demonstrates that resistance to SUT adoption is not uniform across SSA cities but is shaped by context-specific institutional, infrastructural, and socio-economic conditions. While Lagos reflects stronger dependence on informal transport systems and regulatory fragmentation, Johannesburg illustrates how historical spatial inequalities and car-oriented urban development continue to influence mobility behaviour. These findings reinforce the importance of locally adaptive sustainable mobility strategies rather than one-size-fits-all transport policies.

A detailed comparison of these two cities is presented in Table 3.

Table 3. Comparative insights on barriers to sustainable urban transport adoption in Lagos and Johannesburg.

Theme	Lagos	Johannesburg
Structural and Institutional Constraints	Governance fragmentation and limited regulatory enforcement were frequently highlighted. The dominance of informal transport operators often complicates policy implementation.	Institutional structures are more formalized, but coordination challenges between municipal agencies and transport authorities remain significant.
Transport System Limitations	Infrastructure deficits and rapid population growth place significant pressure on existing transport	Public transport infrastructure exists but suffers from reliability and integration challenges. Spatial layout

	systems. Informal transport plays a major role in meeting mobility demand.	creates long commuting distances.
Socio-Cultural Perceptions and Behavioural Resistance	Public reliance on informal transport systems influences perceptions of transport convenience and accessibility. Behavioural resistance is linked to trust in formal transport systems.	Car ownership is often associated with social status, which contributes to resistance toward public transport use. Safety perceptions also influence travel choices.
Urban Inequality and Mobility Justice	Transport affordability and accessibility challenges affect lower-income populations living in rapidly expanding urban areas.	Historical spatial segregation continues to shape commuting patterns, with many residents living far from employment centres.
Pathways for Overcoming Resistance	Improved regulation of informal transport systems and investment in integrated transport networks were suggested.	Greater emphasis on improving public transport reliability and addressing spatial inequalities in urban planning.

4 Conclusion

This study examined resistance to sustainable urban transport (SUT) adoption in Sub-Saharan African cities, focusing on Lagos and Johannesburg. Using a qualitative approach and thematic analysis, the findings reveal that resistance is shaped by interconnected structural, infrastructural, behavioural, and socio-economic factors. Key barriers include governance fragmentation, weak policy enforcement, limited institutional coordination, and inadequate funding, alongside operational challenges such as unreliable public transport, poor integration between formal and informal systems, and insufficient infrastructure for non-motorized mobility. In addition, socio-cultural factors—such as perceptions of safety, reliability, and the social status associated with private vehicle ownership—significantly influence transport choices and contribute to resistance.

The study highlights that overcoming these barriers requires an integrated approach combining stronger governance frameworks, improved and accessible transport infrastructure, and targeted behavioural change initiatives. While Lagos and Johannesburg share common challenges, the drivers of resistance differ based on local contexts, underscoring the need for tailored, city-specific strategies. Enhancing equity and accessibility for marginalized populations remains central to achieving sustainable mobility. As illustrated in Figure 1, resistance to SUT adoption emerges through the interaction of governance, infrastructure, behavioural, and mobility justice dimensions, highlighting the interconnected nature of sustainable mobility transitions in SSA cities.

In the short term, policymakers should prioritize improving transport reliability, strengthening enforcement mechanisms, enhancing commuter safety, and implementing behavioural awareness campaigns aimed at improving public perceptions of sustainable transport systems. Over the long term, structural reforms should focus on integrated transport governance, equitable infrastructure investment, formal–informal transport integration, and spatial planning strategies that reduce mobility inequalities and support sustainable urban development.

Overall, the findings contribute to ongoing discussions on sustainable transport transitions in developing cities and provide practical insights for policymakers, while also pointing to the need for future research incorporating broader stakeholder perspectives and additional urban contexts.

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