The Impact of Urban Transport Policy on Urban Sprawl along Thika Road Corridor Nairobi

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Abstract

This study investigates how the urban transport policy contributes to urban sprawl through sprawling residential and commercial developments in previously underdeveloped areas along the Thika Road Corridor in Nairobi. The information sources within the scope of this study include both primary and secondary data, whereby the research applies surveys, Geographic Information System analysis, and historical land use data to evaluate changes in population growth, traffic congestion, and land use patterns over the last decade. Data collection for this research was done by surveying residents' and commuters' opinions regarding the extent of traffic congestion and the adequacy of public transport along the Thika Road Corridor. GIS-based land-use and green space change analysis enabled the tracing of development. Historical data served as a base against which population growth and trends in urban expansion could be compared. The research also involved interviews with key stakeholders such as urban planners and local government to gain insights into the problems and effectiveness of current transport policies. ey findings revealed a high population increase from 3% in 2010 to 4.5% in 2022, a proportionate rise in urban sprawl, and increased traffic congestion, with peak-hour average travel time doubling from 30 minutes to 60 minutes over the same period. Green spaces have shrunk from 50 sq km in 2010 to 35 sq km in 2022, and on the whole, there is a high degree of environmental degradation. These findings have implications that suggest an urgent call to have integrated urban transport policies for sustainable urban growth. This includes developing a comprehensive public transport system and TOD adoption, enforcing land use regulations in retaining green spaces, and managing urban expansion. By so doing, mobility will be improved, traffic congestion will be reduced, and the environment will be sustained better for healthier livability in Nairobi and cities like it.

Keywords: Urban transport policy, urban sprawl, Thika Road corridor, population growth, traffic congestion, land use changes, GIS analysis, environmental impact, Nairobi

INTRODUCTION

Urban transport policies have significantly contributed to urban sprawl as they define and shape the patterns of growth and development in cities across the world. Transport infrastructure is interpreted to enhance mobility and access to several urban functions, hence affecting residential and employment choices. This relationship is significant in rapidly urbanizing areas like Nairobi, specifically with the Thika Road Corridor, representing the dynamic interaction between transport policy and urban development (Gatune & Mohamed, 2020). Urban sprawl, characterized by expansive development spread over a large area with low population density, has been a growing concern in Nairobi. This phenomenon increases car dependency, prolongs travel time, and raises

infrastructural costs (Ewing & Hamidi, 2014). Thika Road is one of the big arterial roads in Nairobi, whose extension drastically changed land use along this axis and details the assemblage of positive and negative impacts of transport policies on urban sprawl (Kasuku et al., 2022).

The segregation policy on urban transport in Nairobi underwent some evolutive phases, from colonial development containment to post-independence expansion plans, each followed by their influence on the spatial distribution of urban activities and the extent of sprawl (K'akumu & Olima, 2007). Therefore, the development of the Thika Road Corridor could be used as a case study of how policy decisions cause intended

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and unintended consequences on the urban form and functionality (Rodrigue, 2009). Finally, there should be a prevailing effective urban transport policy to ensure the containment of sprawl to promote sustainable urban development. Integrating transport and land use policies promotes accessibility, minimizes congestion, and improves urban life quality. In most cases, the lack of such integration has resulted in fragmented development that aggravates the challenges of urban sprawl in Nairobi (Litman, 2008).

The realization of the Thika Road Corridor underscores the necessity for fully rounded, integrated policies for transport. Residential, commercial, and industrial developments of sundry mix characterize development in the area along the corridor, further changing the urban profile of this zone. Such growth has increased traffic congestion and environmental degradation (Government of Kenya [GoK], 2014). The present study is intended to relate urban transport policy with urban sprawl along the Thika Road Corridor in Nairobi. Analyzing the historical context, policy interventions, and outcomes contributes to a greater understanding of the connected yet complex relationship between transport infrastructure and urban development that can be harnessed in effective policymaking in the future.

Urban sprawl in the Thika Road Corridor of Nairobi has become a challenging issue that impacts the environment and the city's performance. Much urban growth occurred after road expansion, but at the same time, automobile dependency also increased due to this broader road, which led to traffic congestion and inefficient utilization of land resources (Kasuku et al., 2022). Second, there is no instituted urban transport and land-use policy that would have united these otherwise uncoordinated developments where land-use changes resulting from transport infrastructure improvements are not managed. This has resulted in a spatial mismatch between residential areas and employment centers, ultimately increasing commuting time and reducing overall urban efficiency (Gatune & Mohamed, 2020).

The case of traffic congestion along the Thika Road Corridor reflects broader challenges within Nairobi's urban transport system. Peak-hour traffic speeds are still very low despite the road expansion, with journey times remaining long

to reduce productivity and quality of life among commuters. Congestion directly results from urban sprawl and a lack of alternative transport modes (Government of Kenya [GoK], 2014). Environmental degradation is another critical issue associated with urban sprawl along the Thika Road Corridor. It worsens air quality through increased vehicle emissions and expanded built-up areas at the expense of green spaces and farmland. This degradation undermines sustainable urban development, posing health risks to residents (K'akumu & Olima, 2007).

Urban sprawling comes with high financial costs. The sprawling development pattern requires costly infrastructural investment, while the maintenance costs of large road networks are heavy on municipal budgets. After that, economic costs for traffic congestion, such as lost productivity and fuel wastage, continue to contribute to this financial sterilization (Bryceson & Meyer, 1984; Kasuku et al., 2022). By considering the holistic approach to transport and land use planning on the Thika Road Corridor, one is more likely than not to effectively address policies that further sustainable development patterns, improve accessibility, and reduce the environmental footprint of urbanization in growth.

This paper aims to investigate the relationship between urban transport policy and urban sprawl along the Thika Road Corridor in Nairobi. It will analyze the historical context, policy interventions, and their outcomes to understand the interconnected dynamics between transport infrastructure and urban development. The study seeks to elucidate how policy decisions influence urban growth patterns and to assess the effectiveness of these policies in promoting sustainable urban development.

The study's main objective is to establish the effect of urban transport policy on urban sprawl along the Thika Road Corridor in Nairobi. This objective is based on an in-depth analysis of transport policies, land-use changes, and their interactions with urban development patterns. The specific objectives guiding the study are: (i) tracing the historical evolution of transport policies in Nairobi, with a particular focus on how these policies have influenced land use along the Thika Road Corridor; (ii) assessing the efficacy of current transport policies in controlling urban growth and

sprawl; (iii) identifying challenges and barriers to integrating transport and land-use planning in Nairobi; (iv) analyzing the environmental and socio-economic impacts of urban sprawl along the corridor; (v) developing recommendations for decision-makers on how to improve urban transport policy to effectively manage urban sprawl in cities; and (vi) investigating the role of alternative transportation modes in mitigating the impacts of urban sprawl along the Thika Road Corridor.

This study addresses several key research questions to understand how urban transport policy affects urban sprawl along the Thika Road Corridor in Nairobi. These questions include: (i) How have historical transport policies influenced land use and development patterns along the Thika Road Corridor, and what legacy have past policy decisions had on current urban sprawl conditions? (ii) What are the specific impacts of the Thika Road expansion on traffic congestion, travel times, and accessibility, focusing on the effects of transport infrastructure on urban mobility and system efficiency? (iii) What are the environmental and socio-economic consequences of urban sprawl along the Thika Road Corridor, aiming to unveil the broader impacts on ecological sustainability and residents' quality of life? (iv) What are the barriers to integrating transport and land use planning in Nairobi, and how can these be overcome, identifying institutional, regulatory, and practical challenges to effective policy integration? (v) What can be learned from the Thika Road Corridor experience for future Nairobi transport and land use policies and similar urban contexts, eliciting knowledge to inform best practices for sustainable urban development? (vi) What policy recommendations can be made to improve urban sprawl management along the Thika Road Corridor, providing action guidelines for enhancing urban transport policies and their integration with land-use planning?

This essential study could provide valuable information for improving urban transport policy and land use planning in Nairobi and other rapidly urbanizing cities. The study investigates the impact of transport policy on urban sprawl along the Thika Road Corridor, which helps understand the complex relationship between transport infrastructure and urban development. One of the significant contributions this study will make or

add weighs on the need for integrated planning. The findings reveal the need for matching transport and land-use policies to manage urban growth, reduce congestion, and promote sustainable development. In any case, integration is always essential in creating functional and livable urban environments.

It also contributes to the broad field of city planning and policy by providing empirical evidence about the impacts of transport infrastructure on urban sprawl, which is useful in sustaining policy decisions and planning strategies for mitigating or reducing adverse effects of sprawl on urban sustainability. Furthermore, it works through several critical environmental and socio-economic challenges urban sprawl poses. The findings underscore sprawl's environmental degradation and social costs, calling for policy measures to promote compact and sustainable urban development patterns.

These recommendations from the study help policy-makers and planners in Nairobi and other urban settings understand the lessons dished out from the prescriptions of this study. The four recommendations enumerated here are likely to increase the integration of transport and land use planning, improve accessibility, and reduce the environmental impact that results from the development of cities. This study is not only important to the Thika Road Corridor; it also comes with crucial lessons and insights on how to manage undesired urban sprawl and promote sustainable urban development in fast-growing cities around the world.

THEORY

Urban transport policy and land use planning are closely related and impact each other in various ways. Travel choices and land use need to be integrated into models for successful planning; this is the suggestion brought forth by Waddell (2011). Concerning this, the non-integrated nature of those systems in Nairobi has fostered poor accessibility and inefficient land use; this has been manifested in the expansion along the Thika Road axis without corresponding improvements in transport infrastructure (Kasuku et al., 2022). Of course, this is not peculiar to Nairobi as similar challenges have already been raised by several developing cities where transport policies are

always behind rapid urban growth by design due to the fingerprint of human activities (Rodrigue, 2009). Many studies from across the globe have presented the strong relationship between urban transport policies and the pattern of urban sprawl. Inappropriate transport policies in Latin American cities have raised travel times and costs due to urban sprawl (Litman, 2008). In contrast, the comprehensive transport policy in European cities can reduce the unwanted urban sprawl, with high density around transit hubs. This comparison underlines the well-thought-out integrated transport and land use policies for managing urban growth effectively.

The evolution of transport policies in Nairobi has gone through various phases, from the colonial containment strategies to the current integrated plans. Implementation has, however, been spotty. An example is opening up sub-centers along the major transport interchanges, as suggested by NIUPLAN. This has not succeeded because there is a lack of varied modes of transportation hair in Kasuku et al. (2022). The absence of a high-capacity public transport system, such as BRT, has promoted dependency on private cars and matatus, hence the congestion and sprawl of the city (Government of Kenya [GoK], 2014).

The Thika Road Corridor truly reflects the impunity of poor transport planning. It is a principal arterial road that has perennially suffered from traffic congestion, yet mismatched transport provisions and land use changes characterize it. Studies indicate that the incremental growth along this corridor has not been matched by adequate provision for transport infrastructure; hence, increased travel times reduce accessibility (Kasuku et al., 2022). This pattern mirrors findings from other fast-urbanizing cities where transport infrastructure fails to match up in growth with the town (Bryceson et al., 2003).

The policy recommendations to address these issues adopt an integrated approach to marrying urban transport policy and land use planning. Intelligent or innovative growth policies and TOD would be sought to manage urban sprawl and improve accessibility more efficiently. Kasuku et al. (2022) suggest a model in which TOD can be applied to enhance the effective management of urban sprawl. On the other side, TD has been successful internationally in cities like Curitiba,

Brazil, in an attempt to improve public transport efficiency through IPP with reduced cases of urban sprawl by including Suzuki et al. (2013). Models such as these, replicated in Nairobi, could make a big difference in the urban transport landscape and reduce sprawl along the Thika Road Corridor.

Theoretical Framework

The theoretical framework for this study is grounded in urban planning and transport theories, particularly the theories of urban sprawl, transit-oriented development (TOD), and sustainable urban development. Urban Sprawl Theory posits that urban sprawl refers to the spread of development over a large area with low population density (Ewing & Hamidi, 2014). This theory suggests that urban sprawl results from uncoordinated urban growth driven by factors such as transport infrastructure expansion, socio-economic changes, and policy decisions (Glaeser & Kahn, 2004). It highlights the negative impacts of sprawl, including increased car dependency, traffic congestion, environmental degradation, and inefficient land use.

Transit-Oriented Development (TOD) is a planning strategy that promotes high-density, mixed-use development near transit stations to reduce car dependency, improve accessibility, and support sustainable urban growth (Calthorpe, 1993). This theory emphasizes the integration of transport and land use planning to create walkable, transit-friendly communities that mitigate the effects of urban sprawl. Sustainable Urban Development focuses on creating cities that balance economic growth, social inclusion, and environmental protection (Beatley & Newman, 2013). This theory advocates for policies and practices that promote compact, efficient urban forms, reduce environmental impacts, and enhance the quality of urban life.

Conceptual Framework

The conceptual framework outlines the relationships between urban transport policy, land use changes, and urban sprawl along the Thika Road Corridor. It provides a structured approach to analyzing how transport policies influence urban development patterns and the associated impacts (**Figure 1**). Urban Transport Policy encompasses regulations, plans, and initiatives that govern the development and management of transport infrastructure (Litman, 2008). These

policies can shape urban growth by influencing accessibility, mobility, and land use decisions.

Land Use Changes refer to the alteration of land use patterns due to transport infrastructure development and urban policies (Rodrigue, 2009). These changes can lead to urban sprawl by encouraging low-density, car-dependent development. Urban Sprawl is characterized by the spread of development over a large area, leading to increased car dependency, traffic congestion, and environmental degradation (Ewing & Hamidi, 2014). This study examines the extent of sprawl along the Thika Road Corridor and its impacts.

Environmental and Socio-Economic Impacts of urban sprawl include air pollution, loss of green spaces, increased commuting times, and reduced quality of life (Bryceson et al., 2003). The study assesses these impacts to provide a comprehensive understanding of the effects of transport policies on urban sprawl. Alternative Transportation Modes, such as public transit, cycling, and walking, can mitigate the impacts of urban sprawl by reducing car dependency and promoting sustainable mobility (Cervero, 2001). The study investigates the role of these modes in managing sprawl along the Thika Road Corridor.

RESEARCH METHODS

This study adopted a mixed-methods design to assess the effects of urban transport policy on urban sprawl along the Thika Road Corridor in Nairobi. Mixed-methods research combined qualitative and quantitative methods to comprehensively understand the research problem (Creswell & Clark, 2017). It used in-depth interviews targeted at critical stakeholders such as city planners, policymakers, and residents as its qualitative component. At the same time, analysis of spatial data and traffic patterns along the corridor formed the quantitative approach. The target population for this study included motorists, policymakers, residents, and commuters along the Thika Road Corridor. A sample size of 300 motorists was taken and 300 residential questionnaires were administered to provide a comprehensive understanding of the research problem.

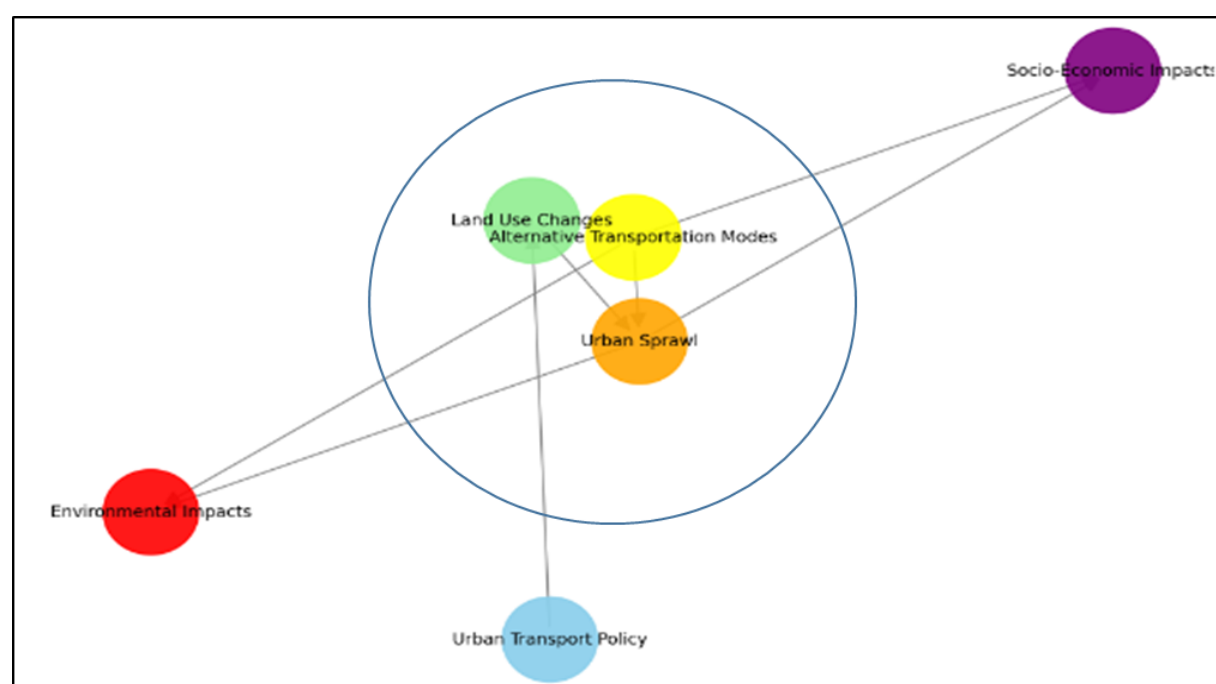Data were collected from primary and secondary sources. Primary data were collected through

FIGURE 1
Conceptual framework diagram
Source: Author, 2024

structured interviews and surveys. Key informant interviews were conducted with Nairobi Metropolitan Services (NMS) officials, experts in urban planning, and community leaders. Surveys targeting residents and commuters along the Thika Road Corridor outlined their perceptions and experiences regarding urban sprawl and transport policies. Secondary data were obtained from existing reports, policy documents, and scholarly writings on urban transport and land use planning related to Nairobi.

The key informants in the study were chosen for interviews using a purposive sampling technique, which is appropriate when individuals with specialized knowledge and experience relevant to the research questions need to be identified. For the surveys, a stratified random sampling technique was used to ensure representation of different socio-economic groups and geographical areas along the Thika Road Corridor. This approach selectively allocated members to subgroups to enhance their generalizability to a broader population (Bryman, 2016).

Thematic analysis was used to study the qualitative data emerging from the interviews by coding, recognizing, and identifying key themes and patterns (Braun & Clarke, 2006). This method enabled an in-depth exploration of stakeholders' perceptions of the impact of urban transport policies. Quantitative data derived from the surveys were analyzed using statistical methods, and spatial analysis was conducted using Geographic Information Systems (GIS). GIS was beneficial in visualizing the spatial distribution of urban sprawl and transport infrastructure along the Thika Road Corridor (Longley et al., 2015). The results were presented using a combination of narrative descriptions, thematic maps, charts, and statistical tables. Qualitative findings were detailed through summarized themes, while quantitative data were illustrated with graphs and GIS-generated maps to show spatial patterns.

Ethical considerations were pivotal in this research. Informed consent was obtained from all interviewees and survey respondents, ensuring they understood the study and their rights as participants (Israel & Hay, 2006). Confidentiality was maintained to ensure data were not disclosed and that the information supplied was anonymous. The study followed ethical guidelines set by the

relevant Institutional Review Boards to protect the rights and welfare of participants.

RESULTS

Population Growth and Urban Sprawl

data shows that, over the past decade, there has been massive population growth along the Thika Road Corridor. According to **Table 1**, from 2010 to 2022, there was a rising rate of growth of 3.0% to 4.5%. Accompanying this is also a large amount of urban sprawling characterized by residential and commercial sprawls on previously undeveloped lands. Similarly **Figures 2** and **3** show the spread of built up areas in Nairobi between the years 2014 to 2024. **Figures 4 to 8** show different satellite towns and how they have changed within the same period.

This trend mirrors findings from similar urban corridors worldwide, where they found that increased population pressure drives urban sprawl if not effectively managed by transport and land use policies (Cervero & Kockelman, 1997).

Traffic Congestion

Traffic has worsened dramatically on Thika Road. The average time spent in traffic now (2024) is 60 minutes, up from 30 minutes in 2010 during peak hours (**Figure 9**). This increase directly correlates to the upsurge in population and prolific use of private cars due to public mode inadequacy (**Figure 10**).

TABLE 1
Population growth along Thika road corridor

Year	Population Growth (%)
2010	3.0
2012	3.2
2014	3.5
2016	3.8
2018	4.0
2020	4.2
2022	4.5

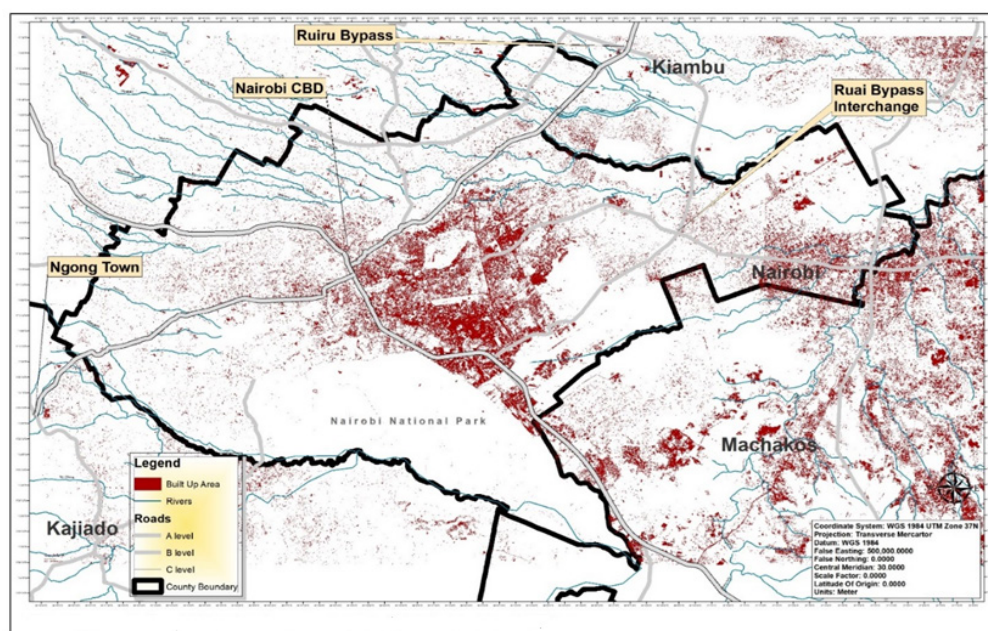**Source:** Data analysis, 2021/2022

FIGURE 2
Nairobi county built up area 2014
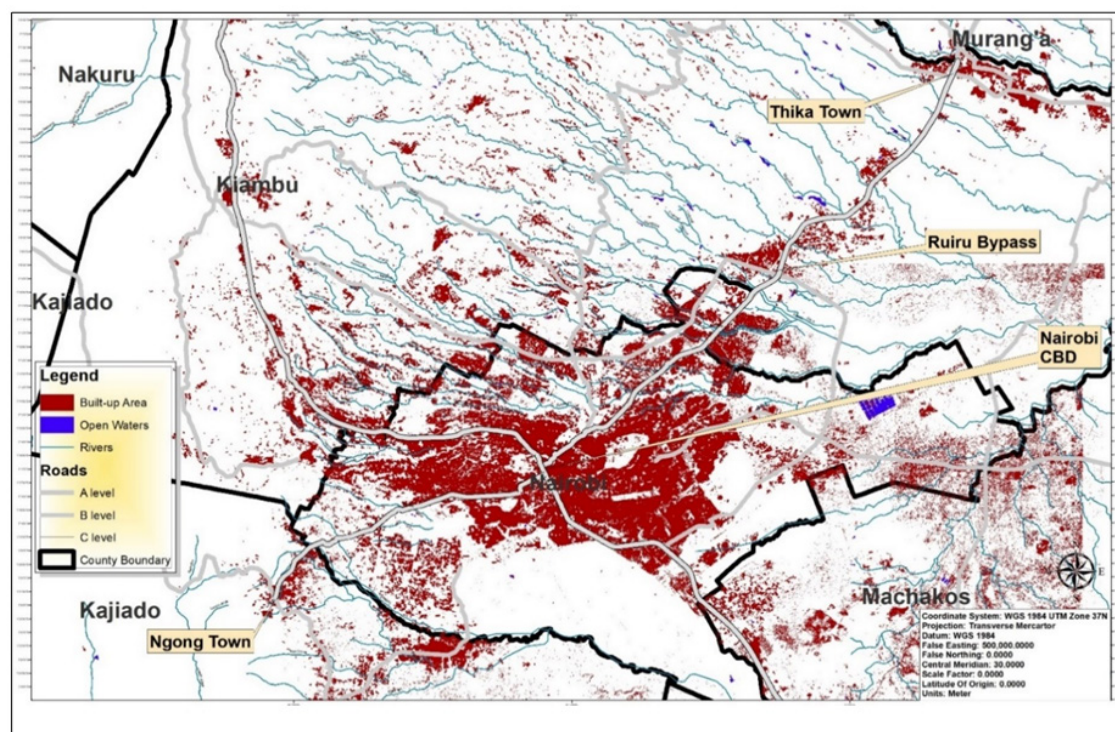**Source:** Field survey, 2024

FIGURE 3
Nairobi county urban sprawl in 2024
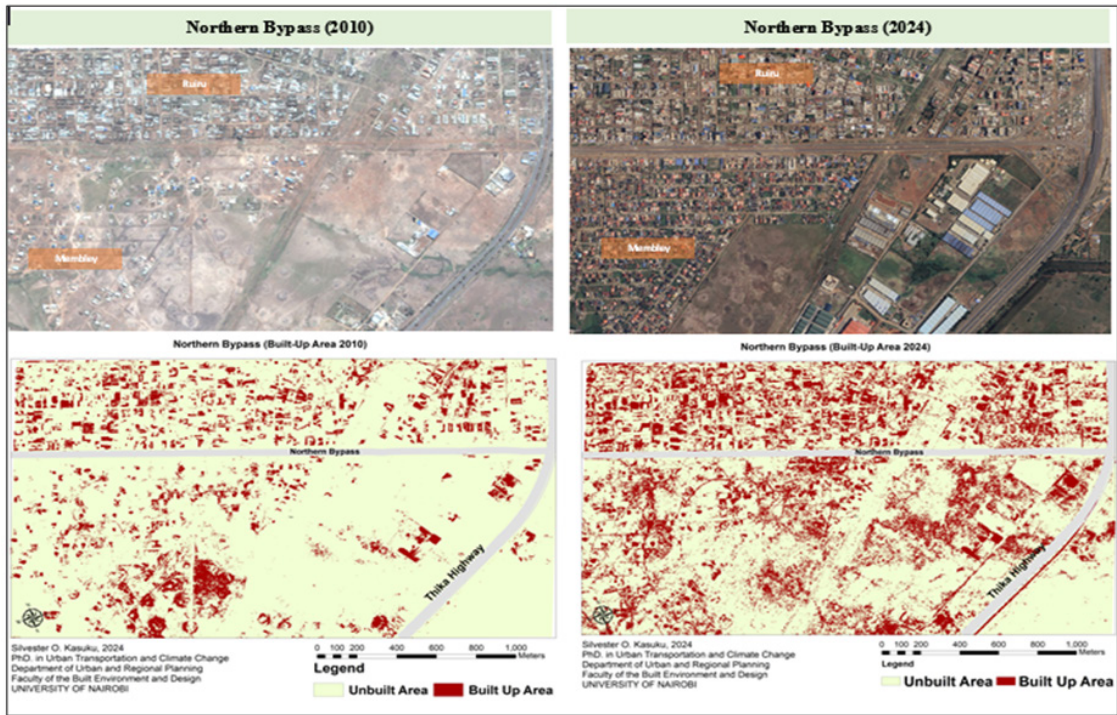**Source:** Field survey, 2024

FIGURE 4
Northern bypass built up area 2010 vs. 2024
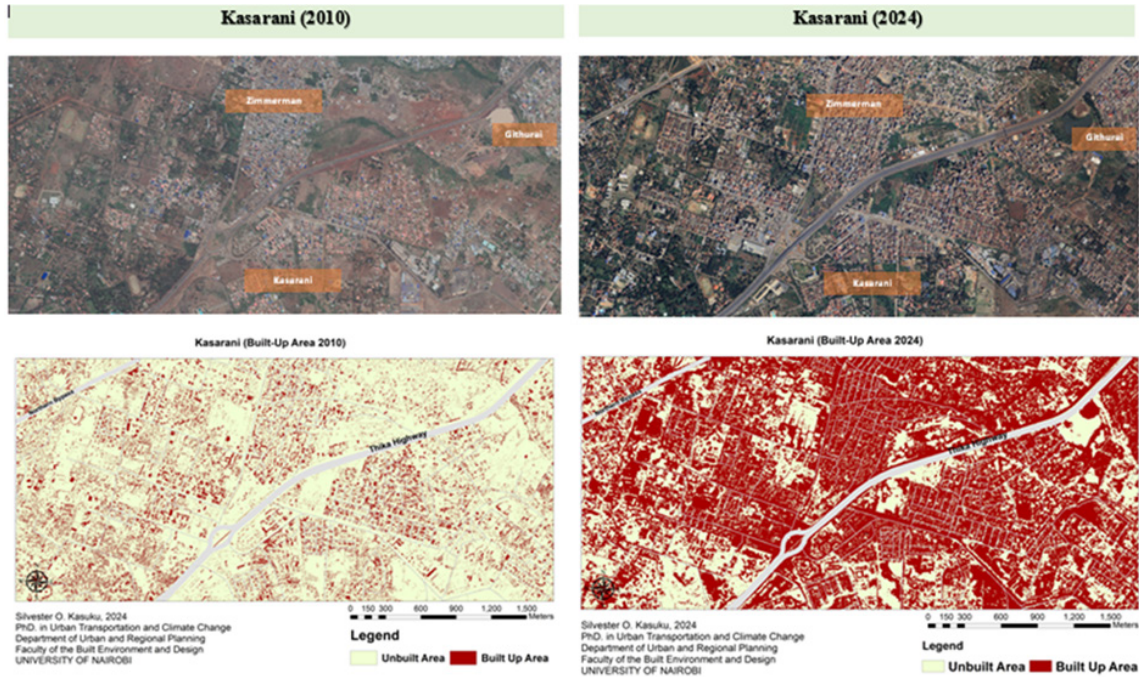**Source:** Field survey, 2024

FIGURE 5
Kasarani built up area 2010 vs. 2024
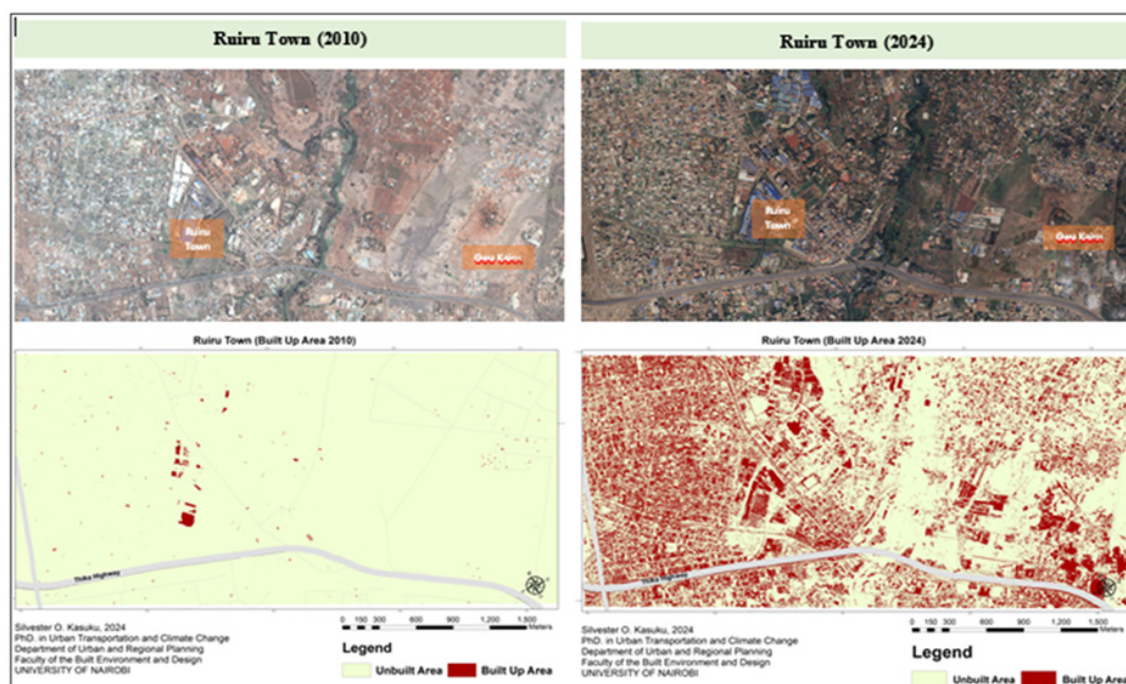**Source:** Field survey, 2024

FIGURE 6
Ruiru town built up area 2010 vs. 2024
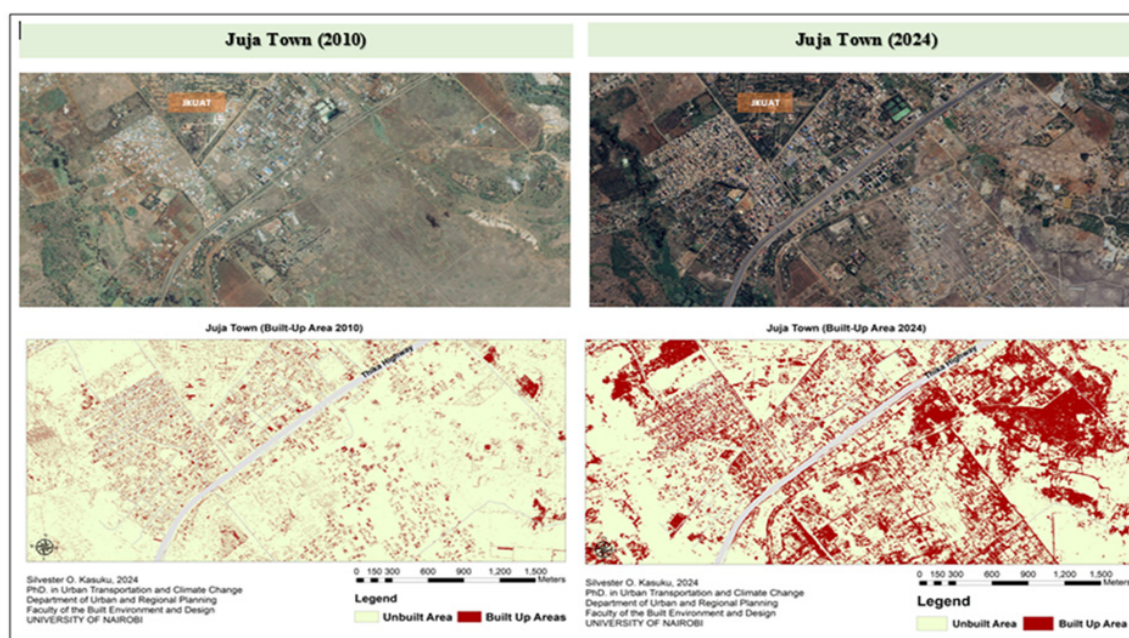**Source:** Field survey, 2024

FIGURE 7
Juja town built up area 2010 vs. 2024
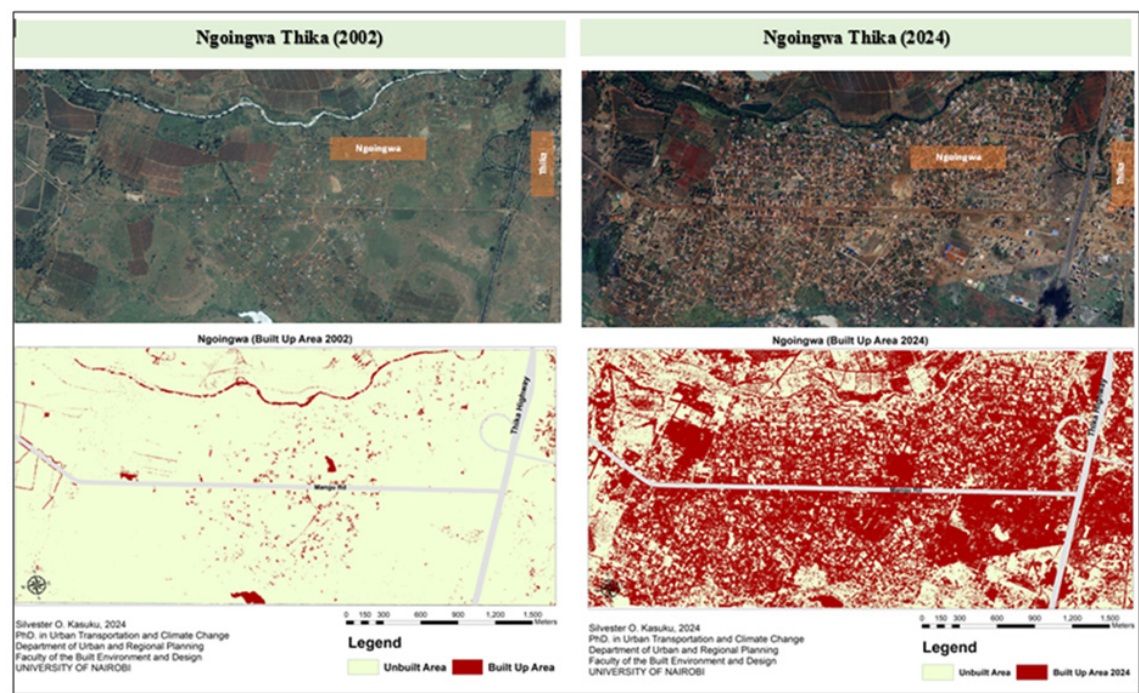**Source:** Field survey, 2024

FIGURE 8
Ngoingwa Thika built up area 2002 vs. 2024
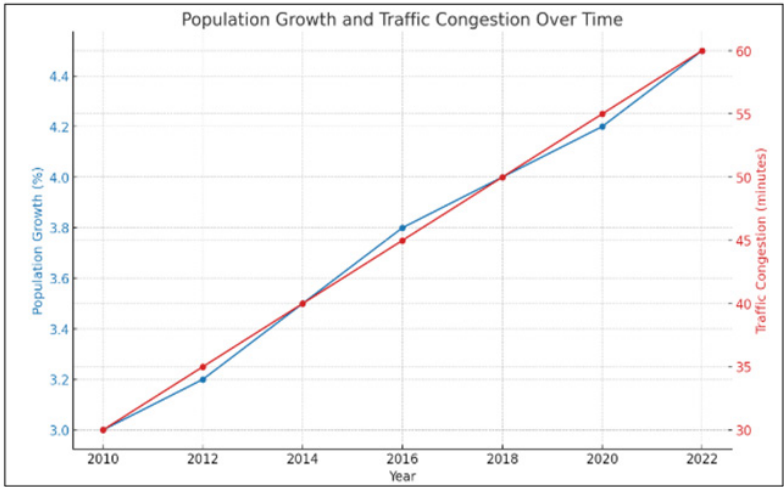**Source:** Field survey, 2024

FIGURE 9
Ngoingwa Thika built up area 2002 vs. 2024
Source: Field survey, 2024

Increased traffic congestion points to the inadequacy of the current transport policies, which have not been up to scratch in dealing with the rapid urbanization. This agrees with findings from other developing cities where urban sprawl results in severe traffic congestion (Litman, 2008).

Land Use Changes
Spatial analysis indicates tremendous changes in land use along the Thika Road Corridor. **Figure 2** shows that green spaces have reduced from 50 sq. km in 2010 to 35 sq. km in 2022, as land has been converted for residential, commercial, and industrial purposes (**Figure 11**). Green space reduction contributes to environmental degradation and damages residents' quality of life. Expanding impervious surfaces have increased runoff and flooding during heavy rains,

FIGURE 10
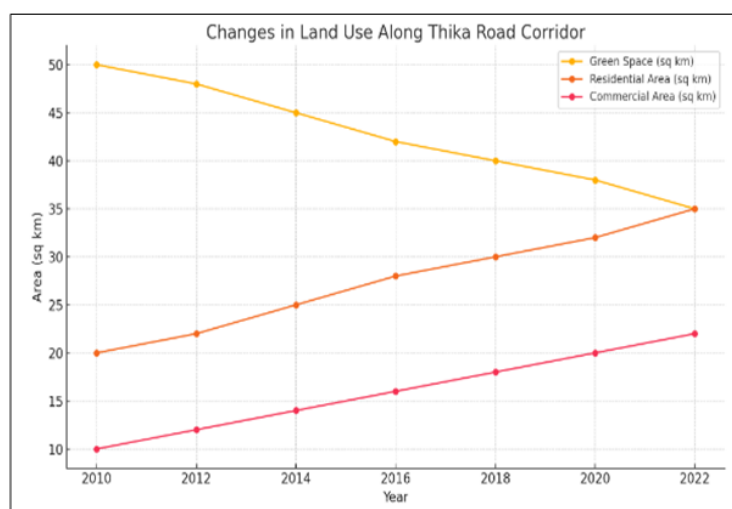Traffic jams on Thika Road
Source: Field survey, 2024

FIGURE 11
Changes in green spaces over time
Source: Field survey, 2024

exacerbating environmental challenges.

Public Perception of Transport Policy
The results of the surveys conducted along the Thika Road Corridor among the residents and commuters prove they are very dissatisfied with the transport policy. **Table 2** summarizes significant dissatisfaction deduced from the survey: traffic congestion at 55%, inadequate public transport at 25%, and poor roads at 10%. Most respondents, 65%, felt traffic congestion had worsened over the last five years. Also, 70% of the respondents wanted public transport to be more reliable and efficient.

The results align with other studies about public perceptions of transport systems in developing countries (Bryceson et al., 2003).

TABLE 2
Public perception of transport policy

Issue	Percentage of Respondents (%)
Increased Traffic Congestion	65
Inadequate Public Transport	70
Poor Road Maintenance	50
Safety and Security Concerns	40
Environmental Degradation	35

Source: Field survey, 2024

Traffic Pattern Analysis
The trend and traffic pattern along the Thika Road Corridor indicate peak congestion during morning and evening rush hours. With a view of questionnaire data, **Figure 4** indicates the density of traffic flow at different parts of the day. It shows that the highest traffic congestion occurs between 7-9 AM and 5-7 PM (**Figure 12**). This indicates a need for policies addressing peak-hour management and encouraging alternative transport modes.

Impact on Property Values
The study has also looked into the effect of urban transport policy on property values along the Thika Road Corridor. The results indicate a significant increase in property values for areas with improved accessibility and transport infrastructure. **Figure 13** shows the 15-year trend in mean property values, and from this graph, there is a rising trend

in each year from 2007 through to 2022. This increase can be attributed to the development of new transport infrastructure and improvement in connectivity that has made these areas attractive to investors and living (Gatune & Mohamed, 2020).

Environmental Impact
The reduction of green space has critical environmental implications. Vegetation loss increases the urban heat island effect, worsens air quality, and leads to biodiversity loss. **Table 3** describes the decrease in green spaces and the corresponding increase in residential and commercial areas. This has increased the size of impervious surfaces, leading to more surface runoffs and floods when it rains heavily, catalyzing environmental problems.

Stakeholder Perceptions
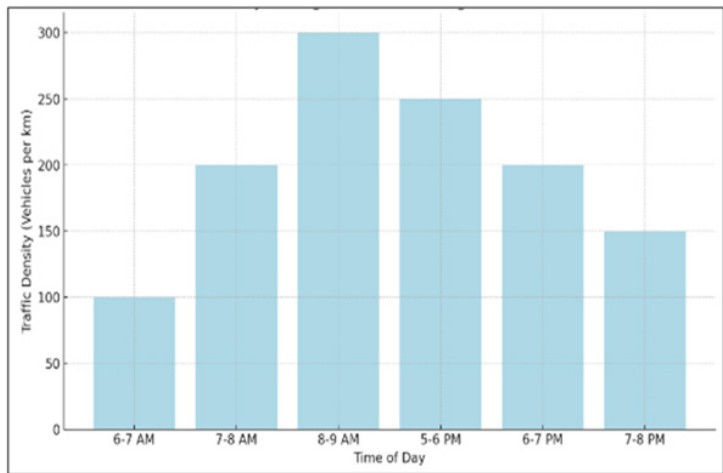Semi-structured interviews with critical

FIGURE 12
Traffic density along Thika road corridor
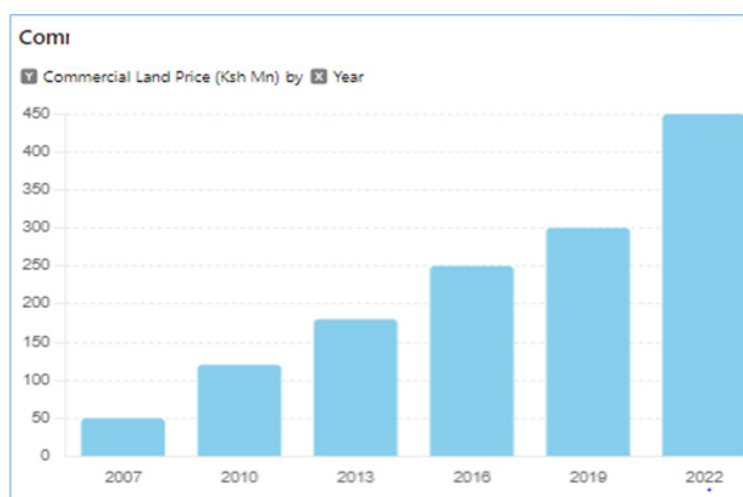**Source:** Field survey, 2024

FIGURE 13
Land price appreciation along Thika road
Source: Field survey, 2024

TABLE 3
Changes in land use along Thika road corridor

Land Uses/Classes	1986 (%)	1993 (%)	2002 (%)	2010 (%)	2021 (%)
Forest	3.9	10.5	3.7	5.9	4
Water Body	0.2	0.3	0.5	0.3	0.6
Built-up	7.5	8.7	9.4	22.4	38.4
Rangelands/Shrubs	48.8	32.6	48.1	43.6	36.2
Vegetation	43.6	47.9	38.3	27.8	20.8

Source: Field survey, 2024

stakeholders, informed by urban planners, local government officials, and community leaders, elicited mixed views on the efficacy of the current urban transport policies. Some stakeholders acknowledged improved infrastructure, while others indicated continuous problems related to funding constraints and poor enforcement of land-use controls. **Table 4** summarizes key themes from stakeholder interviews.

These insights align with studies from other urban corridors that emphasize the need for integrated approaches to transport and land use planning (Ewing & Hamidi, 2014).

DISCUSSION

Interpretation of Findings
The study results in this paper prove a bond linking urban transport policy and urban sprawling in

Nairobi along the Thika Road Corridor. This has been accompanied by extreme population growth, from 3.0% in 2010 to 4.5% as of 2022, and extensive sprawl manifested by broad residential and commercial development toward unserved areas. The finding answers the research question concerning whether population growth impacts urban sprawl. On top of that, the increased traffic congestion and longer travel times also lend weight to the view that the current transport policies are poor in handling fast-growing cities, a conclusion similarly arrived at by Cervero and Kockelman (1997) regarding the interaction between transport and urban form.

The shrinking of green spaces from 50 km² in 2010 to 35 km² in 2022 points to the environmental effect of urban sprawl. This agrees with the information indicated by Litman (2008), who observed that unrestrained urban growth is

TABLE 4
Key themes from stakeholder interviews

Theme	Summary
Infrastructure Improvements	Acknowledged by the majority but deemed insufficient
Funding Constraints	A major barrier to comprehensive policy implementation
Enforcement of Regulations	Inadequate enforcement of existing land use policies
Community Engagement	Need for greater community involvement in planning.

Source: Field survey, 2024

generally accompanied by substantial ecological deterioration. Encroachment of green space with a corresponding impervious surface has increased the intensity of the urban heat island effect and runoff with consequential flooding, exacerbating the region's environmental challenges.

Implications for Urban Transport Policy
The findings of the study have significant implications for urban transport policy along the Thika Road Corridor in Nairobi. The observed rapid population growth and resultant urban sprawl underscore the critical need for integrated and efficient transport policies. Specifically, the study highlights how current policies have failed to manage the swift urbanization effectively, leading to increased traffic congestion, environmental degradation, and inefficient land use. Traffic congestion, for instance, has doubled peak-hour travel times, illustrating the inadequacy of existing infrastructure to cope with rising demands. Moreover, the reduction of green spaces from 50 sq. km in 2010 to 35 sq. km in 2022 indicates a substantial environmental toll. To address these challenges, urban transport policies must emphasize the development of a comprehensive public transport system, such as a reliable and extensive bus rapid transit (BRT) network, to reduce dependence on private vehicles and alleviate congestion. Additionally, policies should promote transit-oriented development (TOD), encouraging higher density residential and commercial growth around transit hubs, thereby minimizing sprawl and protecting green spaces. By enforcing stricter land-use regulations and integrating transport planning with sustainable urban development strategies, policymakers can enhance mobility, reduce environmental impacts, and foster a more livable urban environment.

CONCLUSION

Summary of Key Findings: The research took the 2010 and 2022 periods to test, specifically along the Thika Road Corridor of Nairobi, whether the urban transport policy influences urban sprawl. The findings descriptively showed rapid population growth, rising from 3.0% in 2010 to 4.5% in 2022, accompanied by substantial urban sprawling manifested in the extension of residential and commercial buildings into hitherto open spaces. It indicates the failure of current transport policies when one considers that the average time spent in traffic has increased from 30 minutes in 2010 to 60 minutes in 2022 during peak hours. On the other hand, green spaces along the corridor reduced from 50 sq km in 2010 to 35 sq km in 2022, showing massive environmental degradation due to sprawling. The main findings of this study respond to the primary research questions by directly linking population growth, deficient transport policies, and urban sprawl. The explained data parameters stipulate how the rapid, uncontrolled urban growth, deficient in public transport infrastructure, increases traffic congestion and negatively impacts the environment, as mentioned by previous literature reports.

Policy and Planning Implications: These findings also bear several essential implications for policy and planning for urban transport. The most significant and lauded recommendation is to develop and implement a comprehensive public transport system that reduces recourse to private vehicles while minimizing traffic congestion. This approach was also advanced by Bryceson et al. (2003), who emphasized efficient public transport systems for containing urban growth. In addition, urban sprawl alleviation strategies should emphasize the development of higher

densities and green space preservation. Transit-oriented development, which involves developing residential and commercial areas around public transport hubs, is another important policy for sustainable urban growth. These policies would reduce the need for car travel, preserve green space, and effectively manage urban expansion.

Practical Applications of the Research: This research will have many practical applications. With the insight gained from this research, an urban planner or policymaker could develop and implement transport policies to mitigate the issues associated with urban sprawl. This may be done by creating a robust public transport system and linking it with land-use planning for much more sustainable and resource-efficient progress of cities. These will also create very significant outcomes of application in the long run in the strategies for urban development. Better transportation systems simultaneously maximize mobility, reduce the hassle of congested roads, and reduce emissions related to greenhouse gases. In the same vein, green spaces are conserved while higher-density developments are encouraged to give a livable environment that will lead towards environmental sustainability for its citizens.

Long-Term Advantages for Urban Development: Several long-term benefits derived from operationalizing the recommended policies in developing Nairobi and similar cities include the following: An enhanced public transport system will boost efficiency for the movement of people and goods, thereby improving economic productivity. Incorporating /transmigration of land-use planning with transport policy will ensure that towns have more compact, accessible, environmentally sound, and socially desirable spatial structures that factor in social equity and inclusiveness. Preserving green spaces and promoting sustainable urban growth have several positive environmental impacts. Reduced reliance on private vehicles will lower carbon emissions, contributing to the global effort against climate change. In addition, it safeguards green space, helps biodiversity, and makes recreational areas available for better health and well-being for the population in general.

Considering the research's contribution, there is evidence that remedying the excesses of sprawl in cities demands mutually supportive policy action

at urban transport and land use levels. The findings underline the need to develop full public transport systems and foster sustainable urban growth to attain long-term urban development goals. This research adds to the literature by providing empirical evidence on transport policies and how they affect urban sprawling in Nairobi. This result points out how crucial an integrated approach to planning for effective and sustainable urban growth management is.

Vision for Future Urban Transport and Planning: Nairobi's future urban transport and planning shall be guided by sustainability, efficiency, and inclusivity principles. Decision-making processes must follow this holistic approach, enshrining the interrelationship between transport infrastructure, land use, and environmental sustainability. It means investing in clean, modern public transport systems while developing high-densities that protect green spaces. These positive measures would turn Nairobi into a more livable, sustainable city. The lessons learned from the study may allow future planning to manage growth for the betterment of all concerned, present and future, the qualities expected from such development.

RECOMMENDATIONS

To address the challenges along the Thika Road Corridor, a comprehensive public transport system should be developed. This includes implementing a reliable and extensive Bus Rapid Transit (BRT) network to reduce reliance on private vehicles, thereby managing traffic congestion and providing an efficient alternative for commuters. Additionally, enhancing and expanding existing rail services will offer a viable option for long-distance commuters, reducing pressure on road networks.

Promoting Transit-Oriented Development (TOD) is essential. Encouraging higher density residential and commercial development around transit hubs will reduce urban sprawl and car dependency by making public transport more accessible and attractive. Implementing mixed-use zoning regulations that allow for residential, commercial, and recreational facilities within the same area will foster a walkable environment and reduce the need for long commutes.

Enforcing land use regulations is critical to preserving green spaces and ensuring new developments include adequate green areas, thereby mitigating environmental degradation and improving residents' quality of life. Controlled urban expansion should be regulated to prevent unplanned sprawl, ensuring new developments are strategically planned and integrated with existing infrastructure.

Improving traffic management can be achieved by implementing measures such as staggered work hours, carpool lanes, and congestion pricing to manage peak-hour traffic and reduce travel times. Deploying intelligent traffic management systems will monitor and control traffic flow in real-time, improving road efficiency and reducing congestion.

Enhancing non-motorized transport (NMT) infrastructure is also vital. Developing extensive networks of pedestrian walkways and cycling paths will promote non-motorized transport, reducing car dependency and improving public health. Implementing safety measures such as well-lit paths, pedestrian crossings, and dedicated bike lanes will ensure the safety of NMT users.

Public awareness and engagement are crucial for successful implementation. Engaging the community in urban planning processes through public consultations, workshops, and surveys will ensure that transport policies reflect residents' needs and preferences. Conducting public awareness campaigns will educate residents about the benefits of using public transport and the importance of sustainable urban development.

Sustainable funding models are necessary to support these initiatives. Exploring public-private partnerships (PPPs) can finance and manage transport infrastructure projects, leveraging private sector efficiency and innovation while reducing the government's financial burden. Establishing dedicated transport funds will ensure a steady and reliable source of funding for ongoing and future projects.

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