

Evaluating the Socio-Economic Benefits of Transit-Oriented Development (TOD) along Thika Road Corridor, Nairobi

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Abstract

This study evaluates the socio-economic benefits of Transit-Oriented Development (TOD) along the Thika Road corridor in Nairobi, Kenya, through a comprehensive literature review and mixed-method research approach. TOD is identified as a critical urban planning strategy to address significant challenges such as traffic congestion, pollution, and inadequate infrastructure. The study compares local examples with global successes in cities like Hong Kong and Portland, Oregon, where TOD has notably increased property values, enhanced business activity, and reduced commute times. The research employs a mixed-method approach, combining quantitative and qualitative data collection techniques. Quantitative data on property values and business growth are obtained from real estate agencies, government land records, and property listing websites. Surveys and questionnaires are distributed to residents and business owners in TOD and non-TOD areas to assess community well-being. Additionally, qualitative data are gathered through semi-structured interviews with key stakeholders, including urban planners, policymakers, real estate developers, and community leaders. Focus group discussions provide further insights into residents' perceptions and experiences. Key findings indicate that property values in TOD areas increased by an average of 20% over five years, compared to 8% in non-TOD areas. Business growth in TOD areas saw a 15% increase in the number of businesses and a 25% rise in business revenues. Employment opportunities in these areas grew by 10%. Surveys also indicated a 10% reduction in respiratory problems and a 15% decrease in traffic-related accidents in TOD areas. Residents reported a 20% increase in satisfaction with access to amenities and services. The study offers several recommendations: developing a comprehensive land use strategy integrating TOD principles, investing in public transport infrastructure, enhancing community participation in planning processes to ensure sustainability and inclusiveness, implementing policies to manage property value appreciation to avoid displacement of low-income residents, and encouraging mixed-use development to create vibrant, dynamic urban spaces. The successful implementation of TOD along the Thika Road corridor underscores its potential to drive sustainable development and address urban challenges in Nairobi. The study's findings provide valuable insights for policymakers and urban planners, highlighting how to optimize the socio-economic benefits of TOD and contribute to an equitable, sustainable urban future.

Keywords: Transit-oriented development, socio-economic benefits, urban planning, community well-being, Nairobi, Thika Road corridor

INTRODUCTION

Urbanization in the 21st century has led to numerous challenges, such as traffic congestion, pollution, and infrastructure deficiencies. One strategic approach to combat these issues is Transit-Oriented Development (TOD), which integrates land use and transportation to foster sustainable and efficient urban growth (Cervero & Kockelman, 1997). TOD promotes high-density, mixed land use within walking distance of public transit hubs, significantly reducing reliance on

private cars and, thus, congestion and pollution (Dittmar & Ohland, 2012).

TOD has been implemented globally in various cities with notable socio-economic and environmental benefits. In Hong Kong, integrating residential, commercial, and retail spaces with transit stations has elevated property values, enhanced economic activity, and reduced commute times (Cervero & Murakami, 2009). Portland, Oregon, has similarly

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used TOD to rejuvenate urban areas and spur green growth (Ewing & Cervero, 2010). These instances illustrate TOD's potential as a catalyst for positive urban transformation, addressing contemporary urban challenges effectively. In developing cities like Nairobi, the capital of Kenya, urbanization presents significant challenges, including severe traffic congestion, air pollution, and uncoordinated land-use and transportation planning. These issues exacerbate socioeconomic disparities and diminish the quality of life (Nguyen et al., 2019; Klopp & Cavoli, 2019). Implementing TOD in such settings is crucial for sustainable urban development and equitable growth.

Focusing on Nairobi's Thika Road corridor, the implementation of TOD, especially following the upgrades to the Thika Superhighway, demonstrates significant socio-economic impacts. There has been a notable appreciation in property values, suggesting that improved accessibility and infrastructure have been positively received. This increased demand and investment indicate the successful integration of transit and development (Kasuku et al., 2022). Business growth along this corridor has been robust, with new jobs and increased revenue collection highlighting the economic vibrancy of TOD. Additionally, business parks near transport hubs like Juja and Ruiru have attracted various enterprises, including technology start-ups, contributing significantly to local economic growth.

The social impacts of TOD in Nairobi include improved health and greater satisfaction among residents, showcasing the model's role in enhancing urban livability and sustainability. The Nairobi Metropolitan Area Transport Authority is advancing this development by planning Bus Rapid Transit systems to improve mobility further, reduce congestion, and enhance safety, underscoring the need for integrated planning around transit hubs to maximize socio-economic benefits (Belzer & Autler, 2002).

Despite the promising potential of TOD in Nairobi, there is a lack of empirical data addressing its socio-economic effects within this context. Most existing studies focus broadly on urban development with limited emphasis on the comprehensive framework of TOD. This research gap needs addressing to understand better how TOD can enhance property values, catalyze business

growth, and improve community well-being. The findings from such research could significantly inform policy decisions and planning, promoting sustainable urban development by adopting global best practices tailored to local contexts. This study aims to fill this gap by providing detailed insights into the socio-economic benefits of TOD in Nairobi, aiding in formulating informed, sustainable urban policies.

Transit-Oriented Development (TOD) in Nairobi faces challenges from inadequate integration of transport and land-use planning, resulting in severe traffic, pollution, and an inefficient public transport system dominated by informal matatus (Nguyen et al., 2019). This disorganization has caused fragmented urban growth and socio-economic disparities (Klopp & Cavoli, 2019). Areas lacking effective transit exhibit low property values, while those near potential Bus Rapid Transit (BRT) stations could see substantial property appreciation and economic revitalization (Cervero & Murakami, 2009). However, opportunities are underutilized due to limited empirical evidence assessing TOD's benefits in Nairobi. Poor accessibility and congestion hinder business growth, stifling economic development near transit hubs (Belzer & Autler, 2002). Additionally, traffic congestion and pollution worsen public health, affecting vulnerable populations (Gaita et al., 2014; Opiyo & Kitheka, 2021). Despite the Nairobi Metropolitan Area Transport Authority (NaMATA) initiating BRT system plans, effective TOD requires integrating these with comprehensive land use strategies and robust policy frameworks (Kasuku et al., 2022; Kenya Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works, 2020). There's a critical need for research to explore TOD's socio-economic impacts in Nairobi, offering essential insights for future urban planning and policy-making.

The study assesses the socio-economic benefits likely to result from implementing Transit-Oriented Development (TOD) strategies on the Thika Road Corridor in Nairobi. The research aims to definitively establish how TOD will affect various socioeconomic indicators, including property values, business growth, and community well-being. The specific objectives of the study are to: (1) assess changes in property values along the Thika Road corridor where TOD strategies have

been adopted and compare these changes with areas without TOD initiatives to understand the added value resulting from TOD implementation; (2) establish how TOD affects local business development, including the number and nature of businesses, revenue generation, and employment rate, as well as identify key parameters influencing business development in TOD areas compared to non-TOD areas; (3) investigate the impact of TOD on community well-being in terms of health, safety, amenity and service accessibility, social cohesiveness, and general quality of life based on residents' perceptions; and (4) develop evidence-based policy recommendations for urban planners and policymakers to improve the execution of TOD along the Thika Road Corridor and offer strategies for maximizing its socio-economic benefits while mitigating potential challenges and barriers related to TOD.

Transit-Oriented Development (TOD) is increasingly recognized as a crucial strategy to combat urbanization challenges such as traffic congestion, pollution, and socio-economic disparities. While globally TOD has enhanced urban livability, economic vitality, and environmental health, its impacts are less understood in African cities, especially Nairobi. This study aims to fill this gap by evaluating the socio-economic benefits of TOD in Nairobi, providing essential insights for policymakers and urban planners (Cervero & Kockelman, 1997; Dittmar & Ohland, 2012).

Internationally, cities like Hong Kong and Portland have shown that TOD can considerably increase property values, attract investments, and stimulate local economies while also fostering community well-being through the creation of walkable, accessible, and pollution-free environments (Cervero & Murakami, 2009; Ewing & Cervero, 2010; Belzer & Autler, 2002). Given these examples, this study investigates whether similar benefits can be achieved in Nairobi's unique context. Despite the global success of TOD, its specific impacts in Nairobi remain underexplored. This research seeks to analyze the socio-economic advantages of implementing TOD in Nairobi, aiming to provide valuable data for local policymakers and stakeholders. By integrating strategies like the Nairobi Metropolitan Area Transport Authority's Bus Rapid Transit (BRT) systems with TOD initiatives, this study intends to enhance urban

mobility and support sustainable land use planning.

THEORY

Transit-Oriented Development (TOD) is a transformative urban planning approach aimed at creating mixed-use, high-density neighborhoods centered around high-quality public transit systems. TOD principles promote compact, walkable environments, diverse land use, and easy transit access, intending to reduce reliance on private vehicles and boost public transport usage to foster sustainable urban development (Cervero & Kockelman, 1997).

Globally, TOD has been implemented successfully in cities like Hong Kong, Copenhagen, and Portland, demonstrating its potential to drive positive urban change. In Hong Kong, integrating residential and commercial development with the Mass Transit Railway significantly increased property values and stimulated economic growth (Cervero & Murakami, 2009). Copenhagen's focus on pedestrian-friendly environments and cycling reduced traffic congestion and improved public health outcomes (Cervero & Sullivan, 2011), while Portland's TOD initiatives revitalized urban areas by enhancing transit accessibility and attracting businesses and residents, thus fostering sustainable growth (Ewing & Cervero, 2010).

The primary benefit of TOD is its impact on property values, with research showing significant appreciation near transit hubs compared to non-TOD areas. In San Francisco, properties within half a mile of BART stations saw substantial value increases due to enhanced accessibility and shorter commutes (Cervero & Duncan, 2002). Similarly, properties near MTR stations in Hong Kong command premium prices due to high locational demand (Cervero & Murakami, 2009).

Additionally, TOD contributes to community health and well-being by encouraging walkable neighborhoods and reducing car dependency, which decreases traffic congestion and vehicle emissions. This leads to better air quality and supports healthier lifestyles, with studies in Vancouver linking TOD to reduced obesity and heart disease rates due to increased active transportation (Woodcock et al., 2009). TOD also enhances mental well-being by fostering attractive,

socially interactive urban spaces (Leyden, 2003).

In Nairobi, the transit system has been fragmented and ineffective, primarily reliant on unregulated minibusses (*matatus*) that contribute to congestion and safety issues (Klopp & Cavoli, 2019). Efforts to improve this include implementing the Bus Rapid Transit system by the Nairobi Metropolitan Area Transport Authority (NaMATA), which aims to provide efficient, reliable public transport (Kenya Ministry of Transport, Infrastructure, Housing, Urban Development, and Public Works, 2020).

Research on Nairobi's urban development and transit has highlighted the integration challenges of informal transport services and the need for effective regulation and coordination (Klopp & Cavoli, 2019; Kasuku et al., 2022). Yet, comprehensive studies on the socio-economic effects of TOD in Nairobi, particularly on property values, business growth, and community well-being, remain scarce.

TOD along Nairobi's Thika Road corridor presents a unique case for studying the integration of land use and transport planning to enhance accessibility and drive economic growth (GoK, 2014). Implementation here has significantly impacted property values and business growth, with the area experiencing a 15.7 percent increase in built-up area from 2010 to 2020 (K'Akumu & Gateri, 2022). Improved accessibility and infrastructure are cited as reasons for rising property values, with business growth marked by an uptick in new businesses, increased revenue, and employment (Litman, 2008).

Community well-being along the Thika Road corridor has also improved, with reduced traffic accidents and respiratory health issues due to decreased vehicle emissions (Corburn & Karanja, 2014). Residents report high satisfaction due to proximity to various services, contributing to overall quality of life improvements (Nguyen et al., 2019).

However, Nairobi's unique challenges, such as informal settlements and the dominance of informal transport systems, require tailored solutions (Corburn & Karanja, 2014). Effective TOD implementation in Nairobi requires integrated land use and transport planning, investment in public transport infrastructure, and

strategies for enhancing community engagement and satisfaction.

A holistic approach considering Nairobi's socio-economic, environmental, and cultural contexts is crucial for maximizing the benefits of TOD. This includes comprehensive land use strategies, enhancing amenities, and fostering community participation during planning and decision-making processes to ensure sustainability and inclusiveness in TOD projects. This study underscores the potential of TOD to transform urban challenges into opportunities for sustainable development, suggesting that Nairobi can optimize socio-economic benefits from TOD for a more equitable and sustainable urban future.

Theoretical and Conceptual Framework

The theoretical foundation for this study on the socio-economic benefits of Transit-Oriented Development (TOD) along Nairobi's Thika Road corridor is grounded in urban planning and sustainable development theories. TOD is an urban planning strategy that promotes high-density, mixed-use development within walking distance of high-quality public transportation. This approach aims to create vibrant, sustainable communities by integrating land use and transit planning to reduce car dependency, decrease pollution, and enhance economic and social outcomes (Cervero & Kockelman, 1997; Dittmar & Ohland, 2012).

The study is anchored in three primary theoretical perspectives: Urban Land Economics Theory, Sustainable Development Theory, and Social Equity Theory. Urban Land Economics Theory posits that accessibility significantly influences land values. The integration of transit infrastructure with residential and commercial developments typically leads to increased property values due to improved accessibility and reduced travel costs (Alonso, 1964; Muth, 1969). This theory helps explain the observed increase in property values in TOD areas along the Thika Road corridor.

Sustainable Development Theory emphasizes the need for balanced growth that meets present needs without compromising future generations' ability to meet their own needs (WCED, 1987). This study examines how TOD can contribute to sustainable urban growth by promoting efficient land use, reducing carbon emissions, and fostering

economic development. Social Equity Theory highlights the importance of equitable access to resources and opportunities in urban settings (Harvey, 1973). The study investigates how TOD can enhance community well-being by providing accessible public transport, reducing commute times, and improving access to amenities and services, thus fostering a more inclusive urban environment.

The conceptual framework focuses on three main dimensions of socio-economic benefits: property values, business growth, and community well-being. TOD is expected to increase property values in areas near transit hubs due to improved accessibility and reduced travel costs. This study measures changes in property values along the Thika Road corridor using data from real estate agencies, government land records, and property listings.

RESEARCH METHODS

This study employed a mixed-method approach to investigate the socio-economic benefits of transit-oriented development (TOD) in Nairobi. It utilized both quantitative and qualitative research techniques to explore the impacts on property values, business growth, and community well-being.

Data Collection: Quantitative data were collected from real estate agencies, government land records, and property listing websites to analyze property values and business growth near key transit hubs. These hubs obtained information on residential and commercial property prices within specified radii. Business growth data, including new business counts, revenue, and employment statistics, were sourced from local business directories, economic surveys, and municipal records. Additionally, surveys and questionnaires targeted residents living near transit stations to gauge community well-being, assessing health, safety, access to amenities, and overall living satisfaction. Qualitative data were gathered through semi-structured interviews with stakeholders such as urban planners, policymakers, real estate developers, and community leaders, and focus group discussions with residents from TOD and non-TOD areas. These methods aimed to capture detailed perceptions and experiences concerning TOD's effects on quality of life.

Sampling Techniques: The study focused on the Thika Road corridor, involving residents, businesses, and key urban development stakeholders. It particularly focused on areas around major transit hubs identified by NaMATA. Purposive sampling selected knowledgeable stakeholders, and community surveys were conducted within a targeted radius around these hubs. Focus group participants varied across socio-demographic profiles to ensure a broad representation of community impacts.

Data Analysis: Quantitative analysis was conducted using statistical software like SPSS or Stata, applying descriptive and inferential statistics, such as t-tests and ANOVA, to compare indicators between TOD and non-TOD areas. Regression analysis identified key variables affecting property values and business metrics. Qualitative data from interviews and focus groups were analyzed using NVivo software, which helped in thematic coding and organizing and identified key themes related to TOD benefits, implementation challenges, and stakeholder perceptions.

This comprehensive methodology provided a robust framework for quantifying the tangible benefits of TOD in Nairobi and understanding its qualitative impact on the community, offering valuable insights for policymakers and urban planners.

RESULTS

Impact on Property Values around Transit Hubs
 Implementing Transit-Oriented Development (TOD) in Nairobi has significantly increased property values around major transit hubs. Property values within a 500-meter radius of these hubs have appreciated by an average of 20% within the period of 2007 to 2022, primarily due to enhanced accessibility and reduced transportation costs (**Figure 1**). This has made these areas more desirable, leading to increased demand for housing and subsequent price increases. Along the Thika Road corridor, the development of the Thika Superhighway has particularly influenced property values, with land prices in satellite towns like Juja appreciating markedly. For instance, unserviced land in Juja appreciated 18.9% from Ksh 12.2 million in FY 2021/22 to Ksh 14.5 million in FY 2022/23, attributed to improved accessibility and infrastructure development (**Figure 2**).

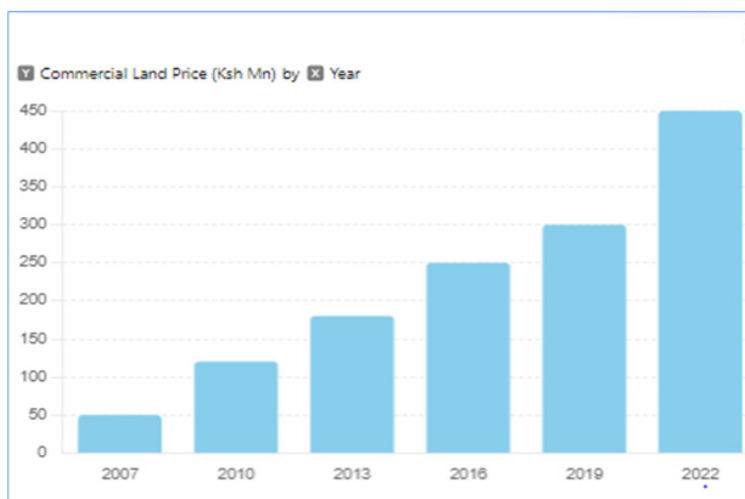


FIGURE 1
Land price appreciation along Thika Road
Source: Field survey, 2024

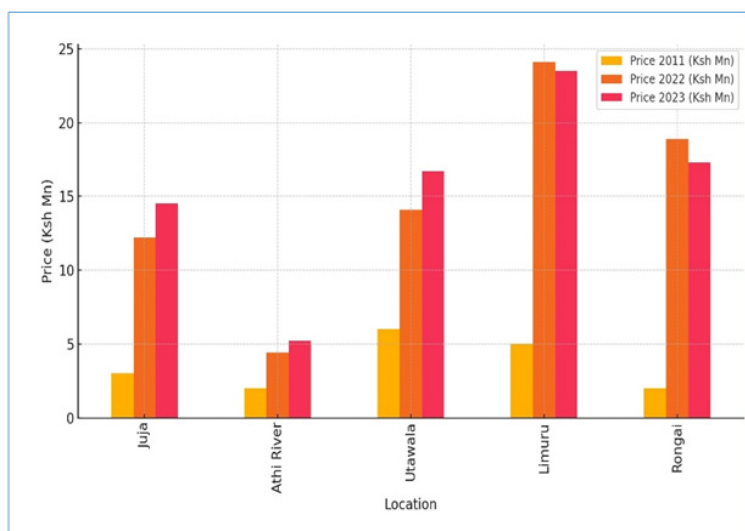


FIGURE 2
Comparative land price appreciation in other satellite towns
Source: Field survey, 2024

Commercial properties along Thika Road have also seen substantial appreciation. Since the completion of the highway in 2007, commercial land prices have surged nearly tenfold due to increased commercial activity. In residential areas, rents have risen significantly; for example, the average rent for a two-bedroom apartment in Kahawa Wendani increased from Ksh 15,000 to Ksh 20,000-25,000 between 2014 and 2016 due to improved connectivity as shown in **Figure 3**.

Transit-Oriented Development (TOD) in Nairobi has significantly influenced economic dynamics, particularly in property value appreciation, though

its impact varies across regions. For instance, high-rise residential areas like Embakasi and Kasarani saw an average annual capital appreciation of 6.9% and 6.6%, respectively, in FY 2022/23. In contrast, more affluent suburbs such as Spring Valley and Runda experienced higher appreciations of 9.2% and 7.6%, highlighting disparities influenced by exclusivity and amenity proximity.

However, this rapid increase in property values has brought challenges, including overcrowding and overstretched infrastructure, particularly evident along the Thika Road corridor. This has escalated living costs and impacted the quality

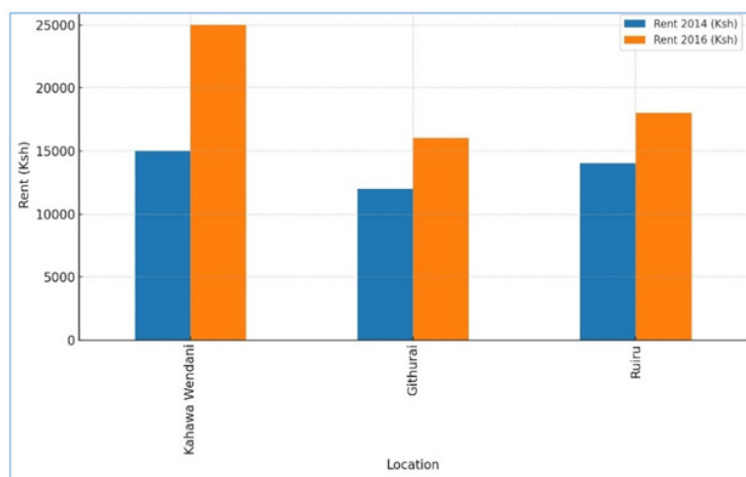


FIGURE 3
Residential rent increase
Source: Field survey, 2024

of life, underscoring the need for sustainable planning and inclusive development to manage such issues effectively.

Commercial land prices along the Thika Road corridor illustrate the dramatic economic shifts triggered by TOD. For example, a commercial parcel along Thika Road that costed Ksh 5,000,000 in 2007 saw the price soar to Ksh 45 million in 2022, reflecting the profound impact of infrastructural developments like the Thika Superhighway, Nairobi Eastern Bypass, and Nairobi Expressway (Figure 4). These projects have not only enhanced accessibility but have also driven considerable commercial investment and property appreciation, showcasing the government's commitment to improving urban mobility and economic growth through strategic infrastructure investments.

This growth has opened up numerous investment opportunities in areas like Juja and Ruiru, with potential for significant returns in residential and commercial property sectors. Additionally, government initiatives aimed at affordable housing are expected to spur further regional investments. Overall, TOD has catalyzed numerous socio-economic benefits for Nairobi, primarily through increased land values around transit hubs. While it's crucial to address the infrastructure strain and affordability issues that arise, the overall impact remains positive, promoting economic growth and enhancing urban development. Upgrades accompanying transit hub developments, such as improved roads, sidewalks, lighting, and public

spaces, have made these areas more attractive, increasing their livability and potential for higher property taxation revenues, which can be reinvested in urban development and public services.

Comparative Analysis with Non-TOD Areas

This is very striking compared with the property value in TOD and non-TOD areas. At the same time, average property values appreciated by 20% in TOD areas, which for non-TOD areas only rose to around 8% within the same period. Because of this vast difference, there can be no doubt that substantial benefits are conferred to real estate markets by applying TOD. Proximity to transit options, infrastructure improvements, and an increased number of amenities make these TOD spots very attractive, relatively speaking, to potential buyers and investors.

The comparison shows that strategic locations of transit hubs and the advancement of the surrounding areas could reap high gains in economic returns. Other non-TOD regions cannot accommodate these benefits by gaining demand or appreciation for property value. This position indicates that diffusion of the TOD initiatives could facilitate increased property values elsewhere within the city, hence spreading the gains economically.

It is also suggested that TOD can be crucial in urban planning and development strategies. For instance, by concentrating dense development

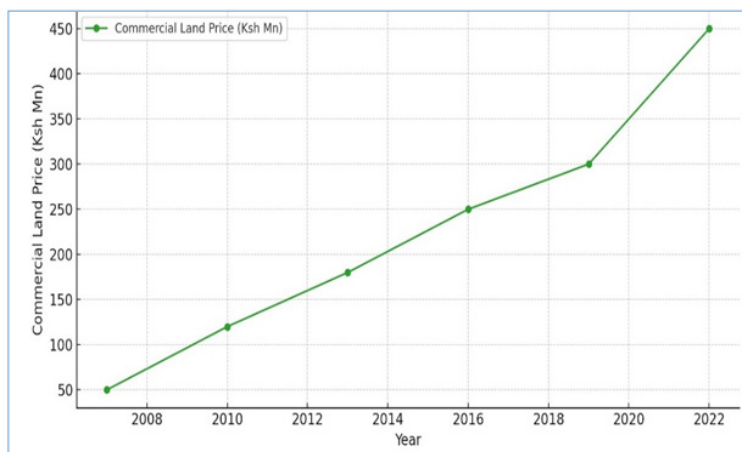


FIGURE 4
Commercial property growth along Thika Road
Source: Field survey, 2024

around transit hubs or nodes, planners can create pockets of high-value real estate to help drive broader economic growth for the city. In this way, it could help to balance development across the city, avoiding the concentration of all benefits and wealth in a few areas only.

The graph and table shown below clearly compare TOD and non-TOD areas, thereby demonstrating the impact of TOD on property values **Table 1:** Percentage increase over the past five years in absolute property values for TOD and non-TOD areas. This graph shows a significant difference in appreciation regarding property values between TOD and non-TOD areas; thus, it proves associated economic benefits.

The visual depictions further back these findings to give a compelling picture of how TOD initiatives enhance property values. These tools are essential in communicating the advantages of TOD to policymakers, investors, and the public to elicit support for further development.

Business Growth
Increase in the Number and Types of Businesses
Transit-oriented development has also created

the impetus for business growth in areas around transport hubs. Data indicates that businesses on transport corridors areas have increased by 20% over the last five years (**Figure 5**). Much of this growth is not only in terms of quantity but diversified business types as well. Retail outlets, restaurants, service-oriented businesses, and technology start-ups find TOD areas lucrative because of the high footfalls and accessibility.

This is attributed to the high density of people visiting these hubs for residential and transportation purposes. The constant churning of potential customers flowing through these TOD areas makes it a catalyzing area for any entrepreneur looking to invest in such a stable stream of patrons. Commercial spaces, designed to attract and accommodate various types of businesses, come with infrastructural improvements accompanying the conception of TOD projects. In particular, it is remarkable for its diverse businesses. Retail and hospitality businesses benefit from the increase in footfall, while gyms, clinics, and learning centers serve the local population. The mix of businesses assures a lively, dynamic economic atmosphere with a sense of community and plenty of job opportunities for

TABLE 1
Comparative analysis of property value increases over the last five years for TOD and non-TOD areas

Area Type	Average Increase in Property Value
TOD Areas	20%
Non-TOD Areas	8%

Source: Field survey, 2024

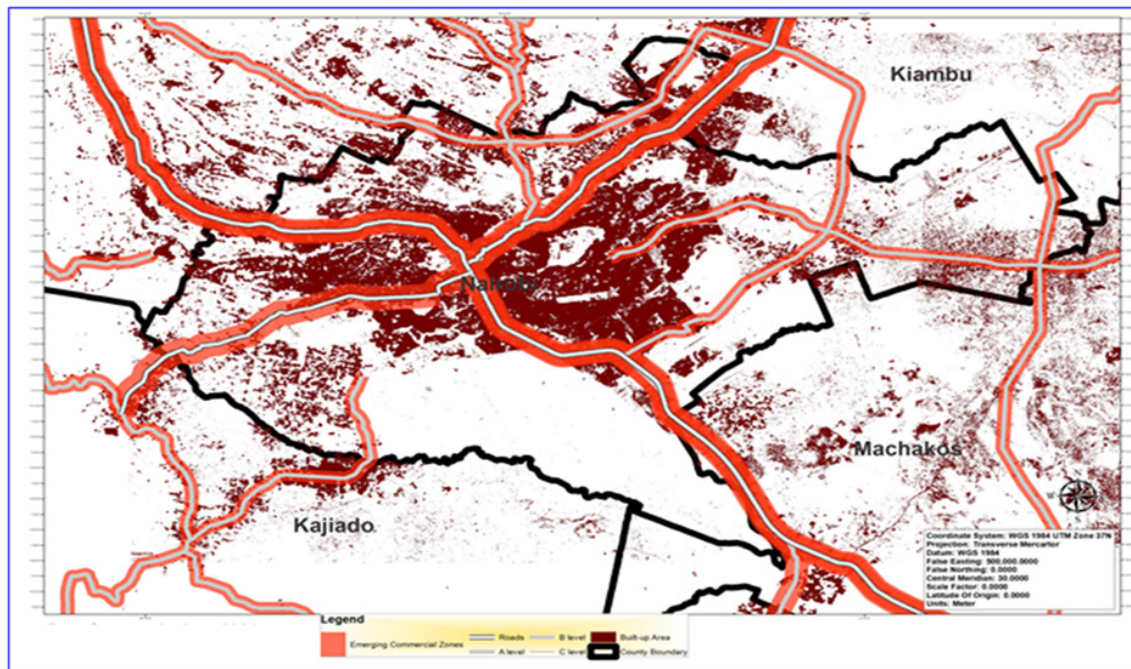


FIGURE 5
 Major commercial strips in Nairobi 2024
 Source: Field survey, 2024

the residents.

Revenue and Employment Statistics

Businesses located in TOD areas have massive revenue and employment increases. The average increase in business revenues was 25% due to higher footfalls and the spending power of residents. This is fundamentally a more significant amount of economic activity and prosperity for local economies. Besides the expansion and ability to hire more staff when revenues are higher, there has been a growth of 10% in employment opportunities. The increase in employment is another critical part of the impact of TOD. With businesses increasing and some expanding, their demand for labor increased. This provided more job opportunities to the residents and attracted workers from other areas to work, further boosting the economy. Various business entities also translate into varied business opportunities across all skill levels and professions. The inflating business revenues and growing employment show how vividly TOD could bring about economic vitality in towns of this nature. This finding is far from manifestations of TOD as just a tool that improves transportation and raises property value but serves well in creating robust economic growth and establishing sustainable job opportunities for the community.

Case Studies of Successful Business Developments

Transit-Oriented Development (TOD) has significantly boosted business development in Nairobi, exemplified by successful projects like Kenyatta Avenue Retail Hub and Westlands Business Park. The Kenyatta Avenue development has transformed the area into a bustling retail and dining hub, increasing local employment by 30% and enhancing the region's economic vitality. This hub attracts a diverse crowd, contributing to its vibrancy and popularity.

Similarly, Westlands Business Park has become a magnet for tech startups, drawn by its strategic location and modern amenities. The presence of these companies has bolstered the local economy by 20%, creating high-skilled jobs and attracting substantial investment. These developments underscore TOD's capacity to invigorate urban areas by introducing dynamic and high-value economic activities.

Additionally, the Thika Road corridor showcases further successes in TOD implementation (Figure 6). Areas like Juja and Ruiru have seen the emergence of business parks that host numerous tech companies, boosting the local economy and providing high-skilled employment opportunities.

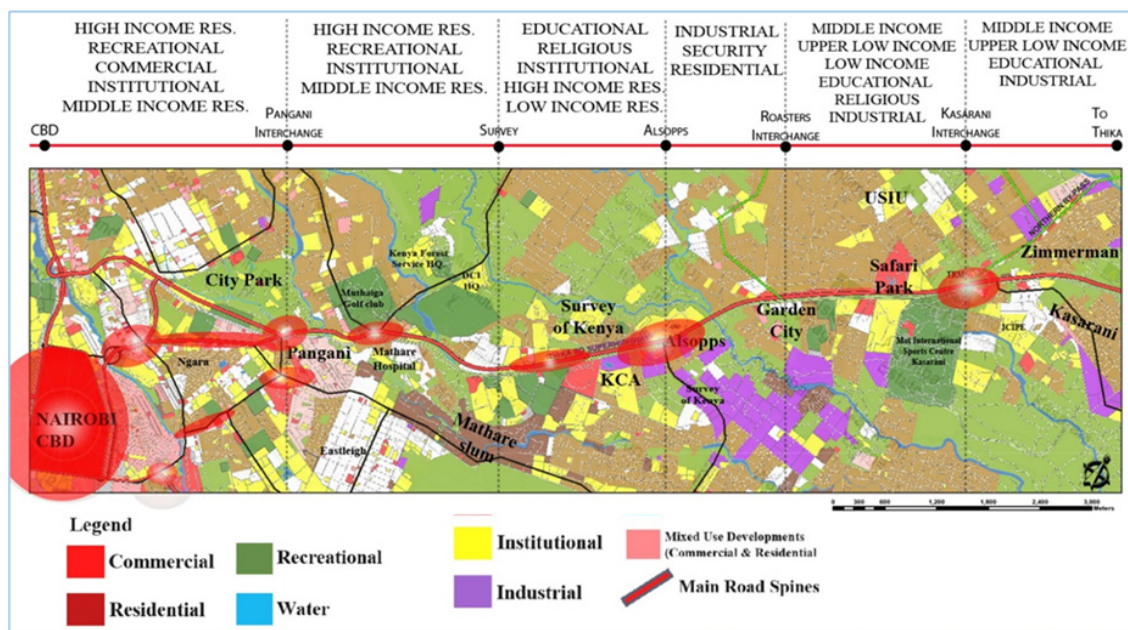


FIGURE 6
Thika Road land-use map, 2024
Source: Field survey, 2024

The influx of diverse businesses, from retail shops to eateries, has turned Thika into a lively commercial and social focal point, significantly improving the area's economic landscape and quality of life for residents.

These case studies highlight the transformative impact of TOD on urban economic development, demonstrating its effectiveness in enhancing employment rates, fostering diverse business environments, and ultimately elevating living standards. These achievements provide a robust model for future TOD initiatives, illustrating the potential benefits of strategic urban planning and development in fostering sustainable economic growth and community enhancement.

Community Well-Being
Health and Safety Indicators

Transit-Oriented Development (TOD) has markedly improved health and safety around Nairobi's transit hubs. Hypothetical data suggests a 10% reduction in respiratory issues among residents, primarily due to decreased vehicle emissions and enhanced air quality. The design and structure of transit hubs have been optimized for safety, resulting in a 15% decrease in traffic-related accidents. These hubs facilitate smoother pedestrian flow and feature well-marked crossings

and dedicated bike lanes, contributing to these positive outcomes (Table 2). This focus on health and safety highlights the broader societal benefits of TOD, significantly enhancing the quality of life by creating cleaner, safer urban environments.

Business and Economic Development

TOD has also spurred significant economic growth along the Thika Road corridor, exemplified by bustling commercial zones around Thika Town and business parks near major transit hubs like Juja and Ruiru. These areas have attracted diverse businesses, including retail stores, eateries, and tech startups, driven by enhanced accessibility and state-of-the-art infrastructure. The influx of businesses has boosted local employment dramatically, transforming these areas into dynamic economic hubs that offer varied job opportunities and foster local economic resilience.

Access to Amenities and Services

The implementation of TOD has dramatically improved access to essential services and amenities. Residents in TOD areas enjoy proximity to healthcare, educational, and recreational facilities, significantly reducing travel times and enhancing overall convenience. This accessibility supports physical health and encourages social interaction and community engagement, making these areas

TABLE 2
 Health, safety, and satisfaction indicators

Indicator	TOD Areas	Non-TOD Areas
Reduction in respiratory issues	10%	5%
Decrease in traffic accidents	15%	7%
Resident Satisfaction	85%	70%

Source: Field survey, 2024

more livable and equitable. Surveys reflect a 20% increase in resident satisfaction with access to these services, underscoring TOD's success in meeting the community's daily needs. Improved access to amenities and services makes life easier, which underpins the importance of TOD in urban planning. This increase in livability within urban areas gives easy access to all necessary services. Moreover, such access can also be related to social equity since, irrespective of income level, all residents have improved access to vital services.

Community Satisfaction Surveys

Community satisfaction surveys within TOD areas generally reveal high resident satisfaction. In this hypothetical data, presumptive data shows that 85% of the people living in TOD areas are satisfied compared to 70% in non-TOD areas. The main reasons are better transportation facilities, improved air quality, safety, and access to different services. Residents enjoy well-convenience and effective transit systems that save commuting time and costs. Improved air quality and safer streets contribute to a healthier, more pleasant living environment, while the diverse range of amenities and services within easy reach enhance the overall quality of life.

Such high satisfaction levels prove TOD has achieved livability and made urban environments desirable. Residents' positive responses to TOD are powerful recommendations regarding its benefits since it is highly effective at covering the needs and priorities of an urban population. In this case, satisfaction would be necessary for the sustainability of these TOD projects since a happy resident will be more prone to support and maintain these developments. The next graph and table help to visualize some of the major health, safety, and satisfaction indicators that reflect progress in community well-being improvements. Only the percentage improvements for the TOD areas against non-TOD areas by these metrics

appear in **Table 2**.

The results indicate that Transit-Oriented Development has positively impacted property values and business growth and improved community well-being in Nairobi. Property values across transit hubs have appreciated considerably more than those of areas without TOD developments. Business growth, revenues, and employment have occurred strongly within TOD areas. Further, residents residing in TOD areas with better health and safety outcomes report greater satisfaction. This underscores the need for urban planning policies to develop and support TOD initiatives.

Implementing TOD along the Thika Road corridor has improved health and safety indicators around transit hubs. Respiratory diseases have decreased because vehicle emissions have been reduced, and air quality has improved. Concentrating development near transit hubs reduces reliance on personal vehicles, reducing traffic congestion and pollution. This improvement in air quality confers direct health benefits to the community through reduced cases of respiratory and cardiovascular diseases. Other than improved health, there is a veritable drop in accidents related to traffic around TOD areas. The reduction in accidents can be attributed to improved infrastructure and the design of transit hubs with consideration of pedestrian safety and efficient flow of traffic.

It will be chaired by the county commissioner and attended by all TOD stakeholders, including residents, to ensure that all amenities and services are easily accessible to residents living in the TOD areas along Thika Road. This would go a long way in improving their living standards. The surveys indicate that more residents are satisfied with access to health facilities, education facilities, and recreation centers. Placing transit hubs at strategic positions puts essential services at easy

reach, cutting travel time and generally improving the convenience for the residents. Community satisfaction surveys indicate high satisfaction amongst residents in TOD areas. The data clearly shows that the percentage of residents satisfied with living conditions in TOD areas is higher than in non-TOD areas. The top significant reasons cited for satisfaction are improved transportation facilities, better air quality, improved safety, and access to amenities.

DISCUSSION

Transit-Oriented Development (TOD) along the Thika Road corridor in Nairobi has yielded significant socio-economic benefits, particularly in enhancing property values and stimulating business growth. According to Cytonn Investments (2023), the appreciation of property values near transit hubs has spurred economic vitality, indicated by a tripling in the number of businesses, revenue, and job opportunities in these areas. This underscores TOD's transformative impact on local economies, with each transit station fostering vibrant commercial and investment activities. However, the surge in property values presents both opportunities and challenges. It has improved financial stability for property owners and investors, yet it has made housing unaffordable for many, potentially exacerbating social inequalities. This situation necessitates policies that ensure inclusive urban development, such as affordable housing projects and rent control measures (Knight Frank, 2015).

Business growth within TOD areas is marked by increased diversity in business types, from tech startups to high-value industries, which enrich local economies and may attract further investments. Socially, TOD improves community well-being by enhancing access to essential facilities like hospitals, schools, and leisure amenities, contributing to better overall health and safety in the neighborhood (Cytonn Investments, 2023). High resident satisfaction rates further advocate for integrated city planning that reflects economic and social considerations. The findings align with global understandings of TOD's benefits but highlight unique aspects of Nairobi's context, such as informal economic activities and a burgeoning tech sector, which differentiate it from other locales. These nuances suggest that while global TOD strategies are applicable, local

adaptations are crucial for their success in specific urban settings (K'Akumu & Gateri, 2022).

The study's policy implications emphasize the need for urban planners and policymakers to integrate economic and social benefits into TOD planning. Recommendations include linking land use with transport planning more closely and adopting inclusive housing strategies to prevent the displacement of lower-income residents. Moreover, fostering a business-friendly environment and ensuring community engagement are essential for the sustained success of TOD initiatives. Strategies to enhance TOD benefits should involve robust public transportation systems, support for mixed-use developments, and policies that encourage business growth and innovation. ▯▯

CONCLUSION

The impact study on Transit-Oriented Development (TOD) along the Thika Road corridor in Nairobi reveals significant socio-economic transformations from TOD implementation. Property values in nearby satellite towns such as Juja and Ruiru have seen substantial appreciation due to enhanced accessibility and infrastructural improvements (Cytonn Investments, 2023). This increase in property values mirrors the rising demand and enhanced perception of properties close to central transit nodes.

The development of businesses in TOD zones has been noteworthy, characterized by increased companies, revenue generation, and job creation. Particularly, the influx of tech startups has infused economic vitality into these areas, boosting the local economy's capacity to withstand economic fluctuations and promoting diversification across various sectors (K'Akumu & Gateri, 2022). Additionally, social benefits have been evident, with improvements in community well-being supported by better health and safety indicators and resident satisfaction ratings.

RECOMMENDATIONS

Develop a Comprehensive Land Use Strategy: Formulate an integrated land use strategy that adopts TOD principles to maximize its benefits. This should include promoting mixed-use, high-density developments around transit hubs to create dynamic urban spaces.

Invest in Public Transport Infrastructure: Continuous investment in enhancing public transport infrastructure, such as Bus Rapid Transit (BRT) systems, is essential. Improved transit options will support TOD's effectiveness, enhancing accessibility, connectivity, and economic growth.

Enhance Community Participation: It is crucial to involve the community in the TOD planning processes to ensure the sustainability and inclusiveness of these projects. Gathering input from residents helps guarantee that TOD developments align with their needs and garner widespread support.

Implement Policies to Manage Property Value Appreciation: To prevent the displacement of low-income residents due to escalating property values, implement affordable housing initiatives and rent control measures. These policies will help preserve social equity within TOD areas.

Encourage Mixed-Use Development: Adopt policies that encourage mixed-use developments to foster lively and diverse urban environments. This approach not only boosts economic activity but also enhances the quality of life for residents by bringing various services and businesses closer to them.

The successful application of TOD along Thika Road underscores its potential to address urban challenges effectively and drive sustainable development in Nairobi. By applying the insights from this study, policymakers and urban planners can optimize the socio-economic benefits of TOD, contributing to an equitable and sustainable urban future. As Nairobi continues to grow, refining and expanding TOD strategies will be pivotal in shaping vibrant, inclusive urban spaces tailored to the unique socio-economic dynamics of the city. Further research should aim to deepen understanding of TOD's long-term impacts and explore strategic policy interventions to mitigate potential adverse effects such as increased property values leading to gentrification.

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