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City School Transport System and its Implications on Family Costs. A Case of Nairobi City

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Evans Omwenga Mairura, Silas Mwiti Muketha & Robert Rukwaro
University of Nairobi, Kenya

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Abstract
School transport costs in Nairobi represent a significant and growing burden on households, yet the implications of these costs remain underexplored in urban planning literature. This study examines the implications of the costs of the school transport system in Nairobi City County. Using a mixed-methods longitudinal design over the 2010-2025 period, the research combined household surveys (n=96), school surveys (n=19), stakeholder interviews, and secondary data from the National Transport and Safety Authority (NTSA) and Kenya National Bureau of Statistics (KNBS). The findings revealed that school transport constitutes a significant household expenditure, particularly for low-income families, influencing school choice, reducing educational affordability and reinforcing spatial inequalities through longer commuting distances and higher travel costs. weighted-average monthly transport expenditure rose by 59% nominally from KES 3,200 to KES 5,100 per child between 2010 and 2025, with real costs declining by 33% after inflation. The study further established that inadequate integration of school transport into land-use planning and institutional fragmentation exacerbates persistent accessibility challenges. The findings support the Generalised Cost Theory by demonstrating that household travel decisions are shaped by the combined effects of monetary and non-monetary transport costs. The study concludes that school transport has significant cost implications. It recommends integrating school transport into urban planning through equitable school zoning, improved public transport, and the provision of safe, continuous Non-Motorised Transport (NMT) infrastructure to enhance equitable access to education.

Introduction
This section establishes the research problem by contextualising school transport costs within the city planning challenges and outlining the study's scope, significance, and contributions. Access to education is recognised as a fundamental human right globally. The United Nations Convention on the Rights of the Child (1989) and the Constitution of Kenya (2010) both affirm that every child has the right to free and compulsory basic education. However, the right to education is meaningless if children cannot physically reach their schools (Duri & Takawira, 2026). Transport is the essential link between homes and educational institutions, yet in many cities, particularly in the Global South, school transport systems are inadequate and unregulated, imposing high costs on households (Behrens et al., 2015; Porter et al., 2013).

In Africa, the cost burden of school transport is particularly acute. Rapid urbanisation and population growth have increased the number of schoolchildren, yet transport infrastructure and services have failed to keep pace, resulting in escalating household costs (Pieterse, 2011). Studies across the continent have documented that school transport costs are the fastest-growing component of education expenditure, often exceeding inflation and income growth (Porter et al., 2013). In cities such as Kampala, Dar es Salaam, and Accra, households face unstable fare structures, with costs increasing 40 to 60 per cent during peak hours and rainy seasons, creating unpredictable and unaffordable transport expenses for low-income families (Lucas & Nkurunziza, 2017).

In Kenya, the cost of school transport represents a significant and growing burden on households. Despite the expansion of educational access through Free Primary Education (2003) and Free Day Secondary Education (2008), the school transport system has not developed commensurately, leaving households to bear the full cost of getting children to school (Republic of Kenya, 2003, 2008). In Nairobi, Kenya's capital, the school-age population constitutes approximately 25-30 per cent of the city's 4.75 million residents, representing 1.2 to 1.5 million children who require daily travel to school (KNBS, 2024). Yet challenges in school transport system still persists, and households still absorb the full cost of school travel through walking, public transport fares, private car expenses, or school bus fees (Mutua & Otieno, 2021).

In an ideal urban planning scenario, all children should be able to access their schools safely, affordably, and within reasonable travel time (Wilson et al., 2010). However, existing studies, including Behrens (2018), show that the school transport system is characterised by escalating costs with severe implications for households, children, and the city.

The major physical gap is a systemic failure: a growing student population is confronted with an unaffordable transport system, resulting in long travel times, high household costs, and increased risks to child safety. The research gap is equally significant. Most research focuses on adult work trips and public transport, with the special needs of schoolchildren largely overlooked (Porter et al., 2013). Limited studies have examined the implications of school transport costs on household welfare, child well-being, and urban planning. While few longitudinal study has accounted for changes in school transport costs over time, and limited empirical estimation has monetised the full range of costs financial, temporal, safety, and health that households bear.

This study is significant for four reasons. First, the implications of school transport costs on household welfare have not been comprehensively studied. Second, the temporal costs of school commuting (lost study time, lost parental productivity) have been minimally addressed. Third, the safety and health implications of school transport have been documented in general road safety literature but not specifically linked to school transport costs. Fourth, the urban planning implications of school transport costs traffic congestion, environmental degradation, and spatial inequality remain underexplored. Therefore, the main purpose of this study is to examine the costs of the city school transport system in Nairobi, with a specific focus on their effects on household welfare, educational affordability, spatial equity, and planning.

The theoretical scope of the study focuses on school transport costs for children aged 3-18 in Nairobi City County. It covers pre-primary, primary, and secondary school children. The geographical scope encompasses Nairobi City County, with a critical assessment of three selected sub-counties representing high-density (Embakasi Central), medium-density (Dagoretti South), and low-density (Lang'ata) areas to capture spatial variation in costs.

This study makes several contributions. First, it provides empirical evidence on the full range of school transport costs-monetary, temporal, safety, and health in Nairobi. Second, it demonstrates the

implications of these costs for household welfare, child well-being, and urban planning. Third, it contributes to urban planning literature by highlighting the systemic failure of planning frameworks to address school transport costs. Fourth, it provides an evidence base to help policymakers develop interventions that reduce the cost burden on households.

Conceptualising School Transport and Cost

This section reviews existing literature on school transport systems and costs, drawing on studies from high-income countries, Africa, and Kenya to establish the conceptual and empirical foundations for the study.

A school transport system is the integrated network of infrastructure, vehicles, services, institutions, policies, and user behaviours that enables students to access education reliably, safely, and affordably (Brooks, 2025). This encompasses dedicated school buses, public transport used by students, walking and cycling infrastructure, and private car arrangements. The concept implies coordination across multiple sectors including education, transport, and urban planning. However, scholars disagree on whether school transport should be a public service obligation or a private household responsibility, with European models favouring public provision while US models rely on local school district discretion (Wilson et al., 2010; McDonald & Aalborg, 2014).

School transport system costs are the total expenditure incurred by households, governments, and society to facilitate student travel between homes and educational institutions (Papacostas & Prevedouros, 1993). These costs extend beyond monetary outlays for fares and fuel to include time costs (commuting time), safety costs (accident risks and injuries), health costs (exposure to pollution), and opportunity costs (lost parental productivity). Generalised Cost Theory posits that households make transport decisions based on total costs, not just fares (Wells, 1975). However, scholars disagree on whether time costs should be monetised uniformly, as opportunity costs vary significantly by income level and employment status (Black et al., 2013). This study adopts a comprehensive conceptualisation of school transport costs, recognising that their implications extend far beyond household budgets, affecting child welfare, educational outcomes, and urban sustainability.

Implications of School Transport System Costs

This subsection outlines the literature reviewed on implications of school transport systems from global, African and Kenyan context. Empirical studies from high-income countries demonstrate that well-regulated and subsidised school transport systems significantly reduce household transport costs while improving accessibility, safety and travel efficiency (Wilson et al., 2010; McDonald & Aalborg, 2014). Comparative studies in European cities found that households in cities with dedicated school transport services spent substantially less on school travel than those relying on private vehicles or public transport (Wilson et al., 2010).

Similarly, Australian studies reported that coordinated school transport policies reduced per-student transport costs and improved service reliability, although benefits were not equally distributed across income groups (Black et al., 2013). Studies from the United States further established that school transport expenditure increases with travel distance, making school location and accessibility important determinants of household transport costs (McDonald & Aalborg, 2014). Evidence from China demonstrates that long school commutes negatively affect students' academic performance and psychological well-being, underscoring the broader implications of transport costs beyond household budgets (Ding et al., 2023).

Studies across Africa indicate that school transport systems remain largely fragmented and unregulated, resulting in high monetary costs and unequal access to education (Behrens et al., 2015; Lucas & Nkurunziza, 2017). Comparative research in cities such as Cape Town, Accra, Dar es Salaam,

Lagos and Addis Ababa found that households spend a significant proportion of their disposable income on school transport because dedicated public school transport services are largely absent (Behrens et al., 2015). Longitudinal studies in Ghana and Malawi further revealed that school transport costs have increased faster than household incomes, forcing families to adopt coping strategies such as long-distance walking, school transfers and temporary relocation of children (Porter et al., 2013). Research in Kampala also showed that high transport costs and unreliable public transport contribute to transport-related exclusion, particularly among low-income households (Lucas & Nkurunziza, 2017).

Studies in Rwanda have also confirmed that transport costs remain a significant uncovered expense under fee-free schooling policies, with parents spending between 5,000 and 10,000 RWF monthly on student transport, directly affecting enrolment and retention (Mugiraneza, 2018; Mbalaka et al., 2021).

In Kenya, available studies consistently show that school transport is characterised by increasing household expenditure, dependence on walking and informal public transport, and limited policy intervention (Obiero, 1992; Post Buckley International, 1999; Mutua & Otieno, 2021). Early studies established that most pupils walked to school because formal school transport services were limited and public transport costs were unaffordable for many households (Obiero, 1992).

The Nairobi Long-Term Transport Study further reported that increasing public transport fares and the failure of dedicated school bus initiatives contributed to rising household transport costs and declining service reliability (Post Buckley International, 1999). More recent evidence indicates that school transport has become one of the largest household education expenditures, compelling many families to reduce spending on other basic needs or transfer children to schools closer to home to minimise transport costs (Mutua & Otieno, 2021).

Recent research on Nairobi's school term congestion reveals that the spatial mismatch between students' homes and school locations, coupled with the lack of safe and reliable shared school transport, drives up vehicle volumes during term time and creates significant equity challenges (Hatfield et al., 2025).

Despite these contributions, important knowledge gaps remain in the existing literature. Most previous studies focus on travel behaviour, accessibility, or transport modes rather than on the monetary implications of school transport costs for household welfare and education expenditure (Behrens et al., 2015; Mutua & Otieno, 2021). Existing research also provides limited longitudinal evidence on how school transport costs have changed over time, particularly within rapidly growing African cities (Porter et al., 2013).

Furthermore, few studies comprehensively assess the broader implications of school transport costs by integrating household expenditure, travel time, affordability and spatial variations within a single urban planning framework (Wilson et al., 2010; Lucas & Nkurunziza, 2017). Consequently, this study addresses these gaps by examining the monetary implications of school transport system costs in Nairobi City and their effects on household welfare, while considering the associated temporal and spatial dimensions.

Theoretical Framework

This section presents the theoretical underpinnings of the study, outlining the key theories adopted and their relevance to analysing school transport costs in Nairobi. Generalised Cost Theory, developed by Wells (1975) and later refined by Papacostas and Prevedouros (1993), posits that household travel decisions are influenced by both monetary costs (fares, fuel, maintenance) and non-monetary costs (time, safety, comfort, and health). Unlike traditional economic models that focus solely on financial outlays, this theory recognises that households evaluate the total or "generalised"

cost of each travel option and select the mode that minimises this combined burden. The theory is particularly relevant to this study because school transport decisions in Nairobi involve complex trade-offs: parents may choose walking to eliminate monetary costs despite longer travel time and safety risks, or opt for motorised transport to save time at the expense of higher fares. In this study, the theory is employed in the results section to interpret expenditure patterns and mode choices, and in the discussion to explain household trade-offs affecting welfare and educational access.

Transport Cost Theory, originating from Johann Heinrich von Thünen's (1826) location theory and later expanded by Rodrigue (2020), explains how transport costs influence spatial location decisions and accessibility. The theory posits that the cost of overcoming distance shapes where activitiesincluding schools are located and how households access them. In the context of this study, the theory helps explain why areas with sparse school distribution (such as Lang'ata) incur higher transport costs: households must travel longer distances, increasing both direct monetary expenditure and time costs. However, Transport Cost Theory largely overlooks social costs such as safety and health, limiting its explanatory power for the full range of household burdens identified in this study.

Systems Theory, proposed by Ludwig von Bertalanffy (1968), views transport as an interconnected system involving infrastructure, institutions, land-use, and households. The theory emphasises that changes in one part of the system (e.g., school location policies) have cascading effects on other parts (e.g., household transport expenditure, traffic congestion). In this study, Systems Theory provides a framework for understanding how institutional fragmentation among the Ministry of Education, Nairobi City County, NTSA, KURA, and NaMATA contributes to persistent school transport challenges. However, the theory provides limited guidance for quantifying transport costs, making it more suitable as a complementary rather than primary framework.

While Transport Cost Theory and Systems Theory offer valuable spatial and institutional perspectives, this study adopts Generalised Cost Theory as its primary framework because it most comprehensively captures the combined financial, temporal, and opportunity costs experienced by households. The other two theories are employed as complementary perspectives that address specific dimensions spatial distribution of schools (Transport Cost Theory) and institutional coordination challenges (Systems Theory) that Generalised Cost Theory does not fully explain. This multi-theoretical approach enables a more holistic understanding of school transport costs in Nairobi while maintaining analytical clarity through the primacy of Generalised Cost Theory.

Conceptual Framework

This subsection presents the study's conceptual framework, positioning school transport costs as having multiple dimensions with cascading implications and illustrating the relationships among independent, dependent, and intervening variables. Based on the literature review and theoretical framework, this study adopts a conceptual framework that positions school transport costs as having multiple dimensions with cascading implications:

Independent Variables includes the factors that influence school transport costs. They include School Transport System Characteristics comprising mode of transport (walking, public transport, private car, or school bus), travel distance, and school characteristics (location, type, and availability of transport services).

Dependent Variable includes the outcome variable which is the School Transport Cost dimensions encompassing fares and fees, fuel and maintenance expenses, and total household expenditure. Intervening Variables mediate the relationship between independent and dependent variables. They include the Household Socio-Economic Status, Policy and Regulatory Environment (government policies, transport regulations, and institutional frameworks) and Infrastructure Quality (road

conditions, walkways, safe crossings, and public transport facilities). These intervening factors can either exacerbate or mitigate the cost burden on households, influencing the overall implications of school transport costs, see figure 1.

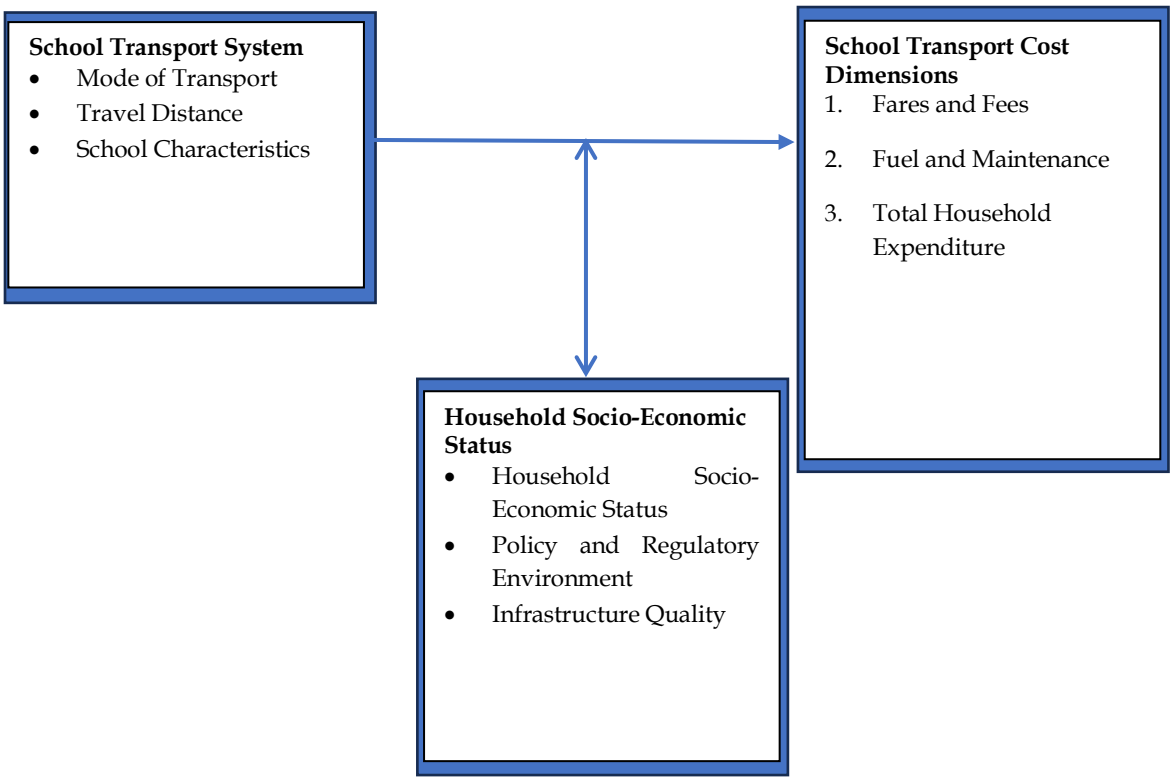

Figure 1: Conceptual Framework

Methods and Tools

This section describes the research design, study area, sampling procedures, data collection methods, analytical techniques, ethical considerations, and limitations of the study. This study employs a descriptive survey design with mixed-methods, conducted longitudinally from 2010 to 2025 to enable systematic comparison of school transport costs, travel time, and safety outcomes. Conducted in Nairobi City County, three sub-counties were purposively selected based on school density to represent the full spectrum of accessibility: Embakasi Central (high-density, 12.94 schools/km²), Dagoretti South (medium-density, 3.74 schools/km²), and Lang'ata (low-density, 0.13 schools/km²). A total of 96 households, 19 primary schools, and 80 pupils (determined using Cochran's formula) were surveyed alongside school transport operators and 30–36 vehicles assessed for condition, with the sample achieving a 10% margin of error at the 95% confidence level.

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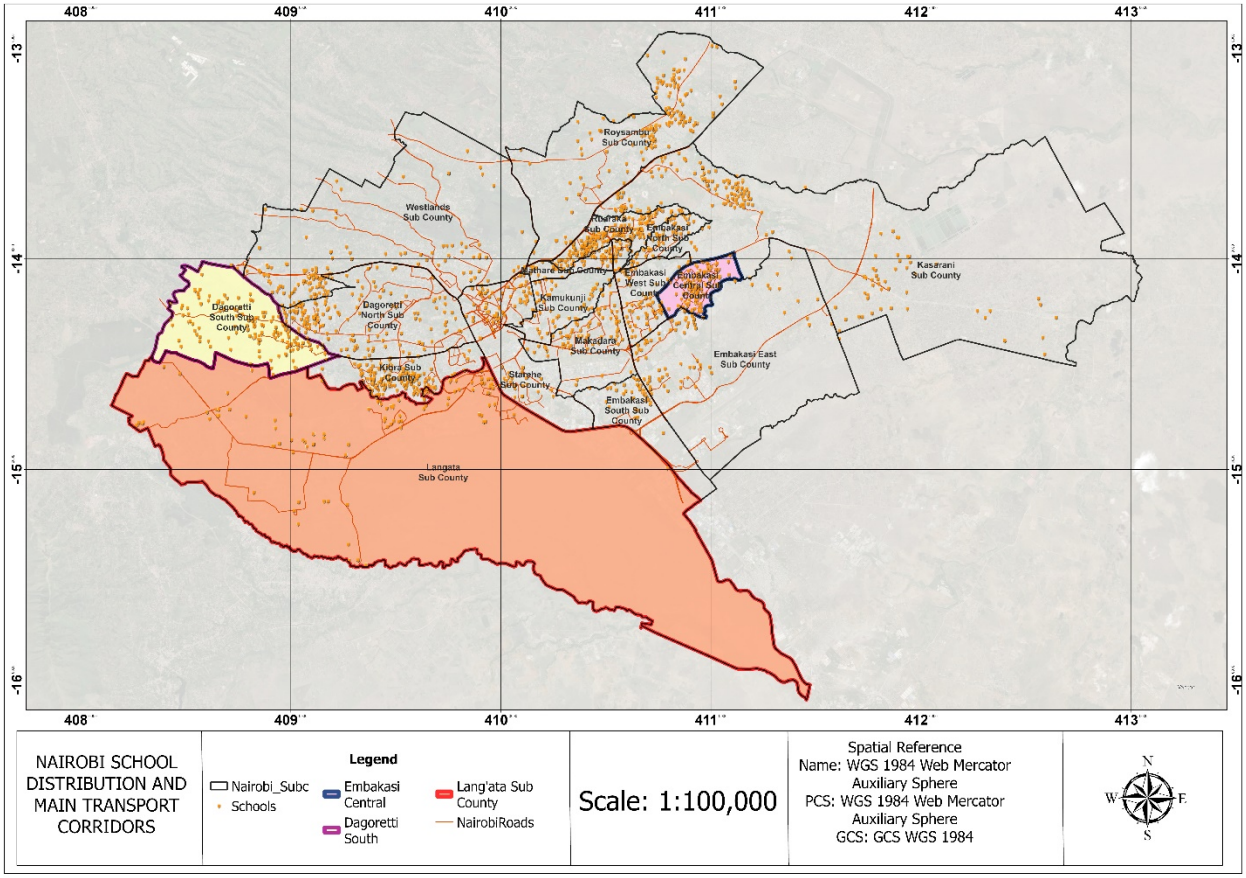

Figure 2: Nairobi City County study area

Quantitative data were collected using structured questionnaires, journey logs, and secondary data from NTSA and KNBS, while qualitative data were gathered through semi-structured interviews, key informant interviews, focus group discussions, and site inspections. Data were analysed using descriptive and comparative statistics, correlation analysis, and thematic analysis, with costs adjusted for inflation using Kenya's Consumer Price Index. The study adhered to ethical protocols including informed consent and confidentiality, with institutional approval obtained from the University of Nairobi. Despite limitations such as recall bias and the absence of a comprehensive transport operator registry, triangulation of data sources enhanced the validity and reliability of the findings.

Results

This section presents the findings of the study, covering household school transport costs, private school transport charges, household welfare implications, spatial inequalities, and institutional and planning implications.

School Transport Costs and Their Implications for Household Welfare

The study found that school transport is among the largest recurring education expenditures for households in Nairobi. Monthly transport costs varied considerably depending on the mode of travel, household location and distance between home and school.

The weighted-average monthly transport expenditure across all modes was KES 3,200 per child in 2010, increasing to KES 5,100 per child in 2025 this represents representing a 59% nominal increase. Households relying on walking incurred no direct monetary costs (KES 0), while those using public

transport spent a median of KES 4,200 per child monthly. Private school transport operators charged a median of KES 5,500, school-owned buses cost KES 7,800, and private car users recorded the highest expenditure at KES 9,500 per child monthly.

As shown in Table 1, households relying on walking incurred no direct monetary costs, whereas those using private cars recorded the highest monthly expenditure, followed by school-owned buses, private transport operators and public transport.

Table 1: Monthly Household Expenditure on School Transport per Child (KES, 2010 vs 2025)

Mode of Transport	2010 (Baseline)	2025 (Follow-up)	Nominal Change	Real Change
Walking only	0	0	—	—
Public transport (matatu/bus)	2,500 (1,500-4,000)	4,200 (2,500-6,500)	+68%	-29%
Private car (fuel only)	6,000 (4,000-8,500)	9,500 (6,000-14,000)	+58%	-34%
School-owned bus	5,000 (3,000-10,000)	7,800 (4,500-15,000)	+56%	-35%
Private school transport operator	3,500 (2,000-5,000)	5,500 (3,500-8,000)	+57%	-34%
Weighted-average (all modes)	3,200	5,100	+59%	-33%

Although nominal transport costs increased across all transport modes between 2010 and 2025, inflation-adjusted analysis indicates that the real cost of school transport declined by approximately one-third during the study period. Public transport expenditure increased from a median of KES 2,500 to KES 4,200 per child per month, while school bus charges increased from KES 5,000 to KES 7,800 over the same period. Similarly, expenditure on private vehicles rose from KES 6,000 to KES 9,500 per child per month. However, these increases remained below cumulative inflation during the study period, resulting in a reduction in real transport costs.

The reduction in real transport costs can largely be attributed to improvements in the spatial distribution of schools and increased transport supply. Between 1997 and 2025, the number of primary schools increased substantially, reducing average travel distances for many pupils. Simultaneously, the rapid expansion of Nairobi's matatu sector increased transport availability and moderated fare increases despite rising fuel prices and operating costs.

Despite the observed decline in real transport costs, school transport continues to impose a significant financial burden on households. The weighted-average monthly transport expenditure of approximately KES 5,100 per child represents a substantial share of household income, particularly among low-income families. For households earning the statutory minimum monthly wage, transporting two children to school consumes almost one-quarter of gross monthly income before accounting for housing, food, healthcare and other household necessities. Consequently, many households remain unable to afford motorised transport despite improvements in accessibility.

The financial implications are reflected in household travel behaviour. Walking remains the dominant mode of transport, accounting for approximately 42% of all school trips, primarily because it eliminates direct transport expenditure. However, while walking reduces monetary costs, it transfers the burden to longer travel times, increased physical fatigue and greater exposure to road traffic hazards.

Private School Transport Charges and Educational Affordability

The study further established considerable variation in transport charges among private schools. Transport costs were primarily determined by distance-based zoning systems rather than household income, resulting in significant differences in annual expenditure among pupils attending the same institution. To protects the privacy of the institutions involved and maintain confidentiality as required by ethical research standards, Initials of schools have been used in place of actual school names. (See Table 2).

Table 2: School Transport Costs from Selected Private Schools (2025)

School	Annual Tuition (KES)	Annual Transport (KES)	Transport as % of Tuition
BB (Zone A - nearby)	2,142,600	168,600	7.9%
BB (Zone D - distant)	2,142,600	303,600	14.2%
RG (Zone 1 - nearby)	105,000	26,400	25.1%
RG (Zone 6 - distant)	105,000	39,600	37.7%

As seen in Table 2 Transport charges constituted a considerable proportion of annual tuition fees. At BB, transport accounted for between 7.9% and 14.2% of tuition costs, depending on residential location, whereas at RG, it accounted for between 25.1% and 37.7% of annual tuition. These findings demonstrate that transport has evolved from a supplementary service into a major educational expenditure.

Distance-based pricing disproportionately disadvantages households located farther from schools. Families residing in peripheral neighbourhoods incur substantially higher transport costs despite receiving similar educational services. Consequently, school location has become an important determinant of educational affordability, with transport expenditure increasingly influencing school choice.

The findings further indicate that transport costs contribute to widening inequalities in access to quality education. While higher-income households can absorb additional transport expenses, lower-income families are often compelled to enrol children in nearby schools regardless of educational quality or performance. Transport costs therefore influence educational opportunities indirectly through affordability constraints.

Household Welfare Implications of School Transport Costs

Beyond direct expenditure, school transport generates several indirect economic costs that substantially affect household welfare. The survey found that 43% of households (41 out of 96 respondents) reported reducing their spending on essential goods and services to cover school transport costs. The household budgets most affected were for food (reported by 67% of affected households, n=27), healthcare (52%, n=21), clothing (48%, n=20), and housing maintenance (31%, n=13).

The burden is further compounded by the opportunity costs associated with accompanying children to school. Many parents reported spending between three and four productive hours each day dropping off and collecting children, particularly where school bus services were unavailable. These lost working hours reduce household productivity and disproportionately affect self-employed workers and casual labourers whose earnings depend directly on daily working time.

School transport, therefore, extends beyond an educational expense to become a broader socio-economic burden. The combination of direct monetary expenditure, lost income opportunities and reduced household consumption contributes to declining household welfare, particularly among vulnerable urban populations.

Spatial Inequalities in School Transport Costs

The study identified pronounced spatial disparities in school transport costs across Nairobi. As outlined in Table 3 Areas with higher school densities generally experienced lower transport expenditure and shorter commuting times than areas characterised by sparse educational facilities.

Table 3: Spatial Variation in School Transport Costs and Implications

Sub-County	School Density (km²)	Average Monthly Cost (KES)	Daily Commute Time	Child Fatalities (2023-24)
Embakasi Central	9.71	1,500-3,000	30-45 min	12
Dagoretti South	3.02	3,000-5,000	45-90 min	9
Lang'ata	0.08	6,000-10,000+	2-3 hours	7

Households in Embakasi Central incurred the lowest transport costs due to higher school density and walkable access. In contrast, Lang'ata recorded the highest costs owing to sparse school distribution, longer travel distances, and greater reliance on motorised transport. These disparities reflect historical planning decisions that concentrated schools in selected areas while leaving rapidly growing residential neighbourhoods underserved.

These findings demonstrate that transport expenditure is closely associated with the spatial distribution of educational facilities. Areas with limited school provision require households to travel longer distances, increasing both direct transport costs and commuting time. Consequently, inequalities in school distribution translate directly into inequalities in household expenditure.

The persistence of these spatial disparities reflects long-standing planning decisions that concentrated educational facilities in selected urban neighbourhoods while leaving rapidly growing residential areas relatively underserved. As a result, historical patterns of urban development continue to influence present-day household transport expenditure.

Institutional and Planning Implications of School Transport Costs

The study established that institutional fragmentation significantly contributes to the persistence of high school transport costs. Responsibility for school transport is distributed among multiple organisations, including the Ministry of Education, Nairobi City County, the National Transport and Safety Authority (NTSA), the Kenya Urban Road Authority (KURA), and the Nairobi Metropolitan Area Transport Authority (NaMATA), with no clearly designated lead agency.

Interviews with senior government officials revealed widespread challenges in institutional coordination. Most respondents identified unclear institutional mandates as the principal barrier to improving school transport, while a majority reported the absence of dedicated inter-agency coordination mechanisms and specific budget allocations for school transport planning. Consequently, school transport remains inadequately integrated within both education and urban transport planning systems.

The study further found that planning interventions addressing school transport have historically remained largely unimplemented. Although successive planning documents recognised school transport as a significant urban mobility issue, recommended interventions such as dedicated school bus systems, integrated land-use planning, staggered school hours and coordinated transport services have not progressed beyond policy proposals except the NMT policy. This implementation gap has contributed to continued dependence on informal transport systems and increasing household transport burdens.

Discussions

This section discusses the key findings of the study in relation to existing literature, theoretical frameworks, and the broader urban planning context.

The findings align with Wilson et al. (2010) and McDonald and Aalborg (2014), who observed that school transport is a significant household expenditure and influences access to education. They also

support Behrens et al. (2015), Lucas and Nkurunziza (2017), and Porter et al. (2013), who argued that fragmented transport systems in African cities disproportionately burden low-income households. Other studies have also confirmed these patterns, with Mugiraneza (2018) demonstrating that transport costs remain a significant uncovered expense under fee-free schooling policies in Rwanda, and Mbalaka et al. (2021) showing that time costs disproportionately affect low-income parents in casual employment.

In Kenya, the findings are consistent with those of Mutua and Otieno (2021) and Post Buckley International (1999) regarding the absence of an organised school transport system. Studies by Hatfield et al. (2025) further supports these findings, revealing that the spatial mismatch between students' homes and school locations in Nairobi drives up vehicle volumes and creates significant equity challenges during school terms. However, unlike earlier studies that focused mainly on accessibility, this study quantifies the monetary implications of transport costs and provides longitudinal evidence on how these costs have changed between 2010 and 2025.

The findings strongly support the Generalised Cost Theory, which argues that travel decisions are influenced by the combined costs of money, time, safety and convenience (Wells, 1975; Papacostas & Prevedouros, 1993). The observed trade-offs among transport expenditure, commuting time, household welfare, and school choice validate the theory's multidimensional perspective on travel costs. The findings also agree with Transport Cost Theory (Von Thünen, 1826), demonstrating that travel distance and location significantly influence school transport costs and educational accessibility. Furthermore, the results support Systems Theory (Bertalanffy, 1968) by showing that school transport costs arise from the interaction of transport infrastructure, school distribution, institutional coordination and land-use planning. However, unlike Transport Cost Theory and Systems Theory, which primarily explain spatial and institutional relationships, Generalised Cost Theory more comprehensively captures the combined financial, temporal and opportunity costs experienced by households, making it the most appropriate framework for this study.

Conclusion

Drawing from the key findings, this concluding section summarises the study's main conclusions and presents integrated recommendations for policy, planning practice, and future research. This study concludes that school transport costs in Nairobi have significant implications for household welfare, educational affordability, spatial equity and urban planning. Despite real-terms decline, transport remains a major financial burden, particularly for low-income households, influencing school choice and access to quality education. Spatial inequalities in school distribution further increase travel distances, commuting time and household expenditure, while institutional fragmentation and inadequate planning continue to exacerbate these challenges. Overall, school transport costs represent not only a household financial burden but also a critical urban planning issue that requires integrated interventions across transport, education, and land-use.

Policies should focus on enacting a School Transport Act by creating an affirmative legal duty on cities to provide, regulate, and subsidise school transport. Establishing a School Transport Fund with ring-fenced revenue (2% education capitation, 1% county revenue). Introduction of subsidised child fares (50% reduction) and a means-tested transport voucher system for low-income households earning below minimum wage to cater for all.

Planning practice should focus on mandating the School Neighbourhood Unit concept for new developments: one primary school per 5,000 persons (0.5-0.7 km radius) to make the travel distance walkable. Planners should also implement catchment-based admission policies prioritising children within 0.5 km. Launch publicly owned subsidised school bus services (50-100 buses) at lower market rates, prioritising high-density areas. Planning authorities should also enforce zoning standards and

development control guidelines that ensure schools are equitably distributed within residential neighbourhoods and supported by safe, continuous Non-Motorised Transport (NMT) infrastructure, including pedestrian walkways and safe road crossings, to minimise long-distance commuting and enhance children's accessibility and safety

This study confirms the applicability of Generalised Cost Theory to African urban contexts but demonstrates that monetary costs alone, even when reduced, have cascading welfare implications that require theoretical expansion to include household coping strategies and spatial equity dimensions. Future research work can focus on conducting a cost-benefit analysis of a publicly owned school bus service in Nairobi. Studies can also quantify the contribution of school trips to traffic congestion and economic costs. Evaluation of gender dimensions of transport cost burdens can also be helpful. Lastly, studies can compare school transport costs and policy approaches across African cities.

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