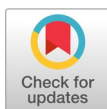


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Impact of the Federal Government of Nigeria's Mass Transit Policies and Programmes on Urban Mobility in the Lagos Metropolitan Area

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Abstract

The study examined the effect of the Federal Government of Nigeria's Mass Transit Policies and Programmes on urban mobility in the Lagos Metropolitan Area. It adopted the theory of Planned Behaviour as a theoretical framework, and employed a mixed-method research design comprising a quantitative survey and qualitative documentary analysis. The target population consisted of daily commuters in Lagos Metropolitan Area, transport policy implementers, and transport infrastructure assets. The total population of the study was approximately 8 million daily commuters. A sample size of 384 respondents was determined. Primary data were collected through the administration of a structured five point Likert scale questionnaire to the 384 commuters. Descriptive statistic was used to present the quantitative data, while multiple linear regression statistical technique was used for analyses and testing the hypotheses at a $p < 0.05$ significance level using SPSS v.27. Findings from the hypothesis One revealed that the National Land Transport Policy has significantly enhanced commuting efficiency in the Lagos Metropolitan Area, with a p-value of 0.001 ($p < 0.05$). The findings from hypothesis Two revealed that federal bus terminal infrastructure investment has significantly enhanced public transport accessibility, with a p-value of 0.000 ($p < 0.05$). Similarly, the findings from hypothesis Three revealed that federal railway modernisation programmes have significantly enhanced multimodal integration, with a p-value of 0.000 ($p < 0.05$). The study concluded that federal mass transit policies have a significant positive effect on urban mobility, with railway modernisation having the strongest effect. The study recommended, among other things, that the Federal Government should establish dedicated monitoring and evaluation mechanisms for the National Land Transport Policy, accelerate construction of bus terminals in underserved suburban areas, expand railway programmes beyond existing lines, and enact legislation mandating maintenance allocations.

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Keywords: federal government of Nigeria, Lagos metropolitan area, mass transit policy, national land transport, urban mobility

Introduction

The rapid growth of the urban population and the increasing density of vehicles in most developed economies around the world has overloaded transport infrastructure, particularly in developing economies (World Bank, [2025](#)). To certain minds, the interaction between modal shift patterns and investments in public transit has become the subject of academic interest. In the context of the study area, Lagos Metropolitan Area in Nigeria, the commercial hub of the country, is facing acute mobility issues as the population of the city grows to over 26 million residents. Mass Transit Policy and Programmes by the Federal Government of Nigeria is the independent variable, which includes federal-level policies such as the National Land Transport Policy (approved July 2025), bus transit schemes (subsidised), railway modernisation projects, and building ultra-modern bus terminals in six geopolitical zones (Federal Ministry of Information, [2025](#)). This independent variable has the following constituents; policy formulation, investment in infrastructure, regulatory frameworks, and intergovernmental coordination mechanisms. The dependent variable, which is urban mobility, is operationalised as efficiency, accessibility, affordability and reliability of movement in the Lagos Metropolitan Area. The relationship between the two variables is that mass transit interventions by the federal government have a direct effect on commuting patterns, travel times, mode choices and performance of the transportation system.

The current statistics show that the mobility crisis in Lagos is grim. Traffic jams cost Lagos ₦4 trillion every year in lost production, fuel wastage, and vehicle depreciation and lost business opportunities (Danne Institute for Research, [2023](#); Lagos State Government, [2025](#)). This number amounts to about 4 per cent of the Nigeria GDP, which is a colossal productivity drainage by a single city (Macaulay, [2025](#)). The mean commuter wastes 2.21 hours a day in the traffic jams, which translates to the loss of approximately 14.12 million productive hours per day (Danne Institute for Research, [2023](#)). Lagos is the most congested city in the world. More than 62 per cent of motorised journeys in Lagos are covered by informal transport, such as minibuses (danfos), motorcycles (okadas), and tricycles (kekes), which indicates the insufficiency of the formal public transport infrastructure (Björkegren et al., [2025](#); Oluwakoya, [2024](#)).

Empirical studies on this nexus have focused on many dimensions in recent times. In a World Bank study based on original panel data and randomised experiments, Bjornkegren et al. (2025) discovered that with the entry of public buses into a route, private minibuses decrease network exit by 16 per cent and reduce networkwide fares, where more than a quarter of the benefits to commuter welfare are due to entry of privately operated transit. Adibeli and Szpytko (2024) studied the viability of electric buses in mass transportation in Lagos and found an Overall Equipment Effectiveness of 51 per cent, which represents sustainable but can be improved performance. Diallo (2025) studied the Lagos BRTs operations in the period of the crisis-prone 2020-2022 and found that BRT has lower resilience than paratransit without operational subsidies.

Korede and Olufemi (2024) analysed transportation mobility and social equity in Lagos Metropolis, finding that public transportation infrastructure remains grossly inadequate in suburban areas, causing traffic congestion as residents lack access to affordable and reliable transport.

Challenges within the area of the study (Lagos Metropolitan Area) include acute traffic congestion, inadequate road infrastructure, proliferating informal transport operations, air pollution from ageing vehicle fleets, high commuting costs, and insufficient multimodal integration (Diallo, 2025; Macaulay, 2025; Oluwakoya, 2024); such as gridlock on major corridors like Ikorodu Road and Third Mainland Bridge where speeds fall below 20 km/h, unreliable danfo and okada services operating outside regulatory frameworks, limited rail coverage (BRT covering barely 15 per cent of commuter routes), and safety concerns from sub-standard vehicles (Lagos State Waterways Authority, 2025), which has exacerbated economic losses, environmental degradation, and social exclusion. In an effort to address these challenges, the Federal Government introduced various initiatives including the National Land Transport Policy (approved by NEC on July 31, 2025), construction of six ultra-modern bus terminals across geopolitical zones, subsidised holiday transport schemes, Compressed Natural Gas conversion centres, and railway modernisation projects connecting Lagos to other regions (Federal Ministry of Information, 2025; Nnah, 2025; The Sun, 2025). Despite these approaches, mobility challenges still persist as implementation remains slow, multimodal integration incomplete, and informal transport continues to dominate.

A study conducted by Björkegren et al. (2025) examined the effect of public bus network rollout on private minibuses in Lagos. The study adopted a mixed-methods design combining original panel data collection with a randomised controlled trial. The population comprises of 8 million daily trips in Lagos. Data were collected using a custom-developed smartphone application to track minibus departures and fare data. Data were analysed using econometric models including difference-in-differences estimation. The study revealed that when the government enters a route, private minibuses depart 16 per cent less frequently, driver profits fall, and drivers switch to connected routes, reducing prices across the network. The study recommended that policymakers should account for private sector responses when designing public transit expansions, and that complementary regulations may be needed to protect commuter welfare on treated routes.

Another study conducted by Diallo (2025) evaluated the resilience of Lagos Bus Rapid Transit system during the crisis-prone years 2020 to 2022. The study adopted a qualitative case study methodology with ethnographic observations and semi-structured interviews. The population comprises of BRT operators, paratransit drivers, and transport officials. Data were collected using participant observation, document analysis, and in-depth interviews with 45 stakeholders. Data were analysed using thematic analysis and process tracing. The research found out that BRT is weaker than paratransit without the operational subsidies, and the modernistic BRT project turns out to perform like paratransit because of the financial limitations. The research suggested that Lagos State was advised to offer permanent operational subsidies to BRT and institutionalise alliances with paratransit unions instead of competing with them.

Similar research by Korede and Olufemi (2024) evaluated how transportation mobility and social equity in Lagos Metropolis are connected. The research design was a survey research. The population is a composition of residents in Lagos suburban areas. Structured questionnaires were used to gather data through the questionnaire that was administered to 384 respondents. Descriptive statistics and chi-square tests were used to analyse data. The paper has found that the infrastructure of public transportation is deplorable in the suburbs, which leads to traffic congestion as most residents do not have access to affordable and reliable transportation, and that socioeconomic differences are a significant

aggravating factor to mobility difficulties. The research suggested that Lagos State needs to focus on the development of transport infrastructure in underserved suburban zones and equity-based fares.

Adibeli and Szpytko (2024) evaluated the viability of electric buses in mass transit in Lagos as well. The research was based on a multidimensional approach which consisted of questionnaires, interviews, inspection and the Overall Equipment Effectiveness modelling. The population comprises of electric bus operators and maintenance personnel. Structured questionnaires (n=150), semi-structured interviews (n=20), and technical inspection of electric buses and charging infrastructure were used to collect data. The analysis of data was performed based on descriptive statistics and OEE calculations. It was found that electric mass transit buses have an OEE of 51 per cent meaning that they are sustainable and need to be improved on renewable energy integration and quality of maintenance to produce substantial results. The study suggested that the quality of the public transportation in Nigeria should be enhanced as well as the incorporation of renewable energy sources to assist in the deployment of the electric buses.

A study by Oluwakoya (2024) investigated the involvement of informal transport systems in the urban environment of the Lagos State. The research took a literature review and secondary data analysis methodology. The population is made up of documented evidence on informal transport activities. Academic journals, government reports, and policy documents of 2000-2024 were reviewed to gather data. Thematically they were analysed with the help of the synthesis. Interestingly, an investigation has shown that informal transport (minibuses, motorcycles, tricycles) offer convenient cheap, and flexible transport to millions of Lagosians, which have helped to generate employment, social unity, and economic growth despite regulatory and safety issues. The research suggested that Lagos State ought to implement inclusive urban transport planning that appreciates the importance of informal transport and utilises its potential using regulatory frameworks and working with formal transport systems.

The research by Alcorn and Karner (2021) evaluated the concept of formal and informal transit integration into a hybrid passenger transport system in Lagos, Nigeria. The research design was a mixed-method study, which incorporates a quantitative ridership analysis and a qualitative interview. The population is built up by the BRT users and danfo operators. The surveys with the commuters (n=500) and the interviews with the

stakeholders (n=30) served as data collection methods. Regression analysis and thematic coding were used to analyse data. The research found out that models of hybrid integration that acknowledge complementary, and not competitive, relationships between formal BRT and informal systems of danfo can be used to increase the overall network coverage and commuter welfare. The research suggested that Lagos State ought to establish formal integration processes such as common route planning, common payment, and controlled points of transfer.

The experience of transport delivery and sustainable development of the Lagos State based on LAMATA. This research took the form of case study presentation at LASU Professorial Chair Lecture. The population comprises of LAMATA's transport projects and programmes. The data were gathered through LAMATA administrative records, project documents and reports on the performance. Thematic analysis and descriptive analysis were used to analyse data. As identified by the study, the structured governance model, technical rigor, and long-term planning frameworks of LAMATA have propelled incredible transformations in expansion of BRT to the historic opening of the Blue and Red Line rail systems, and more than five million Cowry cards in circulation, which allow unified payments in the regulated transport modes. The research suggested that Lagos ought to keep empowering the institutional capacity, magnifying the public-private associations, and making investments in clean mobility technologies.

Research by National Bureau of Economic Research ([2025](#)) investigated the reaction of the private sector to government transit projects in Lagos. The analysis of the study was quantitative and based on administrative records. The fleet includes 820 big modern buses that started to operate in 64 new routes of the public buses in 2020. LAMATA operational databases and private minibus tracking systems were examined and collected to provide the data. Fixed effects regression models were used to analyse the data. The research found out that the introduction of the Lagos public buses made the private minibus departures to decrease by 16 per cent on the competing routes as well as the fare decreasing throughout the network. The research suggested that transit operators ought to expect competitive replies in planning the public buses networks and take into account the complementary policies to control the effects of transitions.

Akanmu and Salisu ([2024](#)) study explored the effects of the environmental peculiarities of Lagos on the performance of transportation

infrastructure. The research design used was a survey research. It is a population consisting of residents in Lagos Metropolis. Structured questionnaires were used to collect data ($n=400$) in 10 Local Government Areas. Descriptive statistics and multiple regression analysis were used to analyse data. The research indicated that the environmental conditions such as flooding, drainage, and road wear largely damage the performance of transportation infrastructure which contributes to congestion and unreliability of travel time. The research advised that Lagos State ought to incorporate climate resilience and environmental management into the transport infrastructure development and maintenance programs.

Gap Analysis: Although the study by Bjornkegren et al. (2025) was conducted on the responses of private minibuses to the rollout of public buses in Lagos, it does not have the same gap compared to the current study on the impact of the Federal Government of Nigeria Mass Transit Policy and Programmes on urban mobility since the current study examined federal-level policy instruments such as the National Land Transport Policy, federal bus terminal investments Whereas Diallo (2025) analyzed the resilience of BRT during crisis years, the present study has a wider range of scope which includes multiple federal programmes. Although the dimensions of social equity were considered in the study by Korede and Olufemi (2024), the present study looks at commuting efficiency, accessibility, and multimodal integration as dimensions of the dependent variable. Adibeli and Szpytko (2024) assessed the feasibility of electric buses, but the present paper determines the policy effectiveness instead of the technical one.

The gaps identified in the reviewed empirical literature include a number of gaps that are covered by this research. Very strict quantitative research of the response of private minibuses to the introduction of public buses in Lagos was conducted by Bjornkegren et al. (2025) but the sample concerned the expansion of the Lagos State-level of BRT and not federal mass transit policies. They used panel data and randomised controlled trials in their study, but they failed to analyse federal policy tools like the National Land Transport Policy and bus terminal programmes. This gap is addressed by the current study by assessing interventions at the federal level.

Diallo (2025) offered qualitative insights of great value to the operations of BRT in crisis years 2020-2022, exposing the issues of resilience when the operations are not subsidized. Nonetheless, the fact that the study is based on one BRT corridor under a certain crisis situation reduces generalisability.

In addition, the paper has not considered federal railway modernisation programmes or their implementation in conjunction with BRT. This gap is addressed in the current study as it investigates multimodal integration within federal and state bus systems that operate railways.

Korede and Olufemi ([2024](#)) investigated the transportation mobility and social equity in the city of Lagos Metropolis, where infrastructure was not sufficient in suburbs. Their survey-based research (n=384) was useful in terms of equity thinking, but failed to measure the particular impacts of federal transit policies on commuting efficiency. The present research bridges this gap by applying multiple linear regression in testing the hypotheses on the relationship between federal policy proxies and urban mobility results.

Adibeli and Szpytko ([2024](#)) tested the feasibility of electric buses in mass transit in Lagos with the help of the OEE methodology. The study was technically rigorous, but it was operational feasibility it looked at as opposed to policy effectiveness; it had no commuter perceptions and behavioural responses. The present research addresses this gap by using commuter survey data to evaluate the perceived effects of federal programmes.

Oluwakaya ([2024](#)) analyzed the role of informal transport systems in a holistic way without assessing formal federal interventions. The present research bridges this gap by narrowing down to the analysis of the federal mass transit programmes as the official substitutes to informal transport.

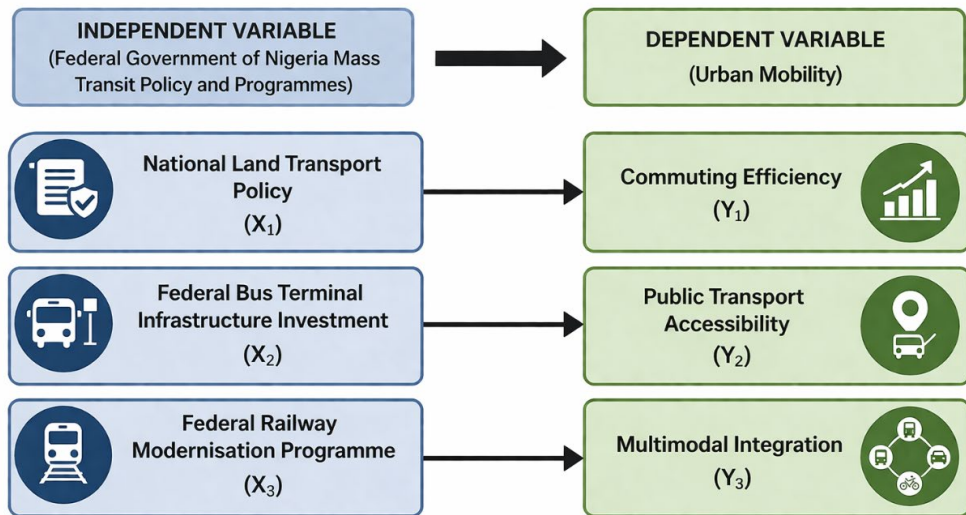
Alcorn and Karner ([2021](#)) evaluated formal and informal transit hybrid integration but their work was pre-dated by more recent federal policy advances such as the 2025 National Land Transport Policy approval. The present paper bridges this gap by including the latest policy developments.

Methodologically, earlier studies have been based on either a purely quantitative one (Bjornkegren et al., [2025](#); Korede & Olufemi, [2024](#)) or purely qualitative one (Diallo, [2025](#); Oluwakoya, [2024](#)). The present research addresses this gap by integrating a mixed-method research design that entails quantitative surveys and documentary data analysis. Most studies were geographically based on a specific corridor or Local Government Area, which restricted representativeness. The present research bridges this gap as it addresses the whole Lagos Metropolitan Area. In theory, although certain studies implicitly rely on behavioural

frameworks, none of them explicitly utilised the Theory of Planned Behaviour to determine how federal transit policies influenced commuter behaviour. The present research satisfies this gap because it uses TPB as a theoretical model.

Figure 1

Research Model



Note. Adapted from Ajzen ([1991](#)); Bjorkegren et al., (2025)

As shown in Figure 1, the research model shows the hypothesised relationships between the independent variable (Federal Government of Nigeria Mass Transit Policy and Programmes) and the dependent variable (Urban Mobility). The independent variable is disaggregated into three proxy components, and each is theoretically expected to affect a given aspect of urban mobility. Such disaggregation enables accurate hypothesis testing and policy-relevant results.

The initial hypothesis is that there exists a relationship between the National Land Transport Policy (X₁) and Commuting Efficiency (Y₁). The National Land Transport Policy, which was endorsed by the Federal Executive Council on July 31, 2025, is a powerful policy that is aimed at reshaping the transportation landscape in Nigeria by introducing clarity and intermodal coordination, as well as infrastructure standards (Federal Ministry of Information, [2025](#); Nnah, [2025](#)). The Theory of Planned

Behaviour (Ajzen, [1991](#)) suggests that the behaviour of commuting can be altered by interventions aimed at the commuter, which affect the perceived behavioural control, that is, when commuters believe that formal transport has become efficient and reliable through national policy frameworks, they tend to switch to formal modes. This pathway is supported by empirical evidence based on the study by Bjornkegren et al. (2025), which showed that improvements in services as a result of policy affect mode choice decisions.

The second hypothesis direction assumes that there is an impact on Public Transport Accessibility (Y 2) by Federal Bus Terminal Infrastructure Investment (X 2). The Federal Government consent to build six state-of-the-art bus terminals in the six geopolitical regions of Nigeria is an important infrastructural investment to formalise the bus transport systems and minimise on-street boarding, which is chaotic (Federal Ministry of Information, [2025](#); The Sun, [2025](#)). Korede and Olufemi ([2024](#)) argue that accessibility in terms of walking distance to stops, frequency of service, and coverage is a determinant of using public transport because it is critical. The strategic placement of terminals in underserved regions can facilitate lower barriers to access, especially to the residents of the suburbs who currently do not have access to affordable and reliable means of transportation.

The third hypothesised direction assumes that Federal Railway Modernisation Programme (X 3) influences Multimodal Integration (Y 3). The roadmap of the federal government on the development of the railway network, such as the Lagos Kano standard-gauge line and the links with the seaports, opens possibilities of easy transfers of the passengers between the railway and bus, and ferry services (Aina, [2025](#); The Sun, [2025](#)). Lagos Metropolitan Area Transport Authority ([n.d.](#)) asserts that to build a truly integrated transport ecosystem, multimodal integration, which is the physical, operational, and financial connectivity between modes is necessary. An example of a step towards financial integration is the Cowry card unified payment system that had more than five million cards in circulation (Lagos Metropolitan Area Transport Authority [LAMATA], [n.d.](#)). According to the theory of Planned Behaviour, perceived behavioural control rises when various modes are harmonized in a smooth way since commuters feel more flexible and convenient, thus motivating them to adopt a different means of transport.

The model also considers the contextual aspects such as socioeconomic

attributes, informal transport dominance presence, and environmental factors that can moderate such associations (Akanmu & Salisu, [2024](#); Oluwakoya, [2024](#)). Nonetheless, the main emphasis is on how the federal policy interventions directly impact the urban mobility outcomes, which is in line with the objectives of the study.

The theory of Planned Behaviour was adopted as Theoretical Framework. The theory as earlier discussed was propounded by Icek Ajzen ([1991](#)). The basic idea about this theory is that human behaviour is guided by three types of considerations: behavioural beliefs (attitude toward the behaviour), normative beliefs (subjective norm), and control beliefs (perceived behavioural control), which together shape behavioural intention and subsequent action (Ajzen, [1991](#)). The theory believes that intention is the immediate antecedent of behaviour, and that perceived behavioural control can directly influence behaviour when it accurately reflects actual control (Devika & Harikrishna, [2020](#)). The basic assumptions of the study are that commuters' mode choice decisions (whether to use federal mass transit programmes) are influenced by their attitudes toward public transport, perceived social pressure from reference groups, and perceived control over using these services (including affordability, accessibility, and reliability). Although, the theory was criticised on the bases of being overly rationalistic and assuming that behaviour is always preceded by conscious intention, neglecting habitual and automatic processes. But this theory is relevant to study the effect of federal mass transit policies on urban mobility because it provides a robust framework for understanding how policy interventions can shape commuter behaviour through influencing attitudes (via service quality improvements), subjective norms (via public awareness campaigns), and perceived behavioural control (via infrastructure expansion and fare subsidies).

The statement of the problem therefore, is to ascertain whether these federal mass transit policy initiatives have addressed urban mobility challenges in Lagos Metropolitan Area. Empirically, previous studies also revealed conflicting views about federal transit policy effectiveness and urban mobility outcomes, especially with limited research focusing specifically on federal-level programmes in Lagos, and this study therefore filled the gap. This study therefore examines the effect of the Federal Government of Nigeria Mass Transit Policy and Programmes on urban mobility in the Lagos Metropolitan Area.

The broad objective of the study is to examine the effect of the Federal Government of Nigeria Mass Transit Policy and Programmes on urban mobility in Lagos Metropolitan Area, Nigeria. While the specific objectives are to: i. examine the effect of the National Land Transport Policy on commuting efficiency in the Lagos Metropolitan Area; ii. determine the effect of federal bus terminal infrastructure investment on public transport accessibility in the Lagos Metropolitan Area; iii. assess the extent to which federal railway modernisation programmes have enhanced multimodal integration in the Lagos Metropolitan Area.

This study seeks to answer the following research questions: i. To what extent has the National Land Transport Policy affected commuting efficiency in the Lagos Metropolitan Area? ii. What is the effect of federal bus terminal infrastructure investment on public transport accessibility in the Lagos Metropolitan Area? iii. Does federal railway modernisation programme significantly enhance multimodal integration in the Lagos Metropolitan Area?

The following hypotheses were drafted to guide the study and stated in the null form (H₀): H₀₁: There is no significant effect of the National Land Transport Policy on commuting efficiency in the Lagos Metropolitan Area. H₀₂: There is no significant relationship between federal bus terminal infrastructure investment and public transport accessibility in the Lagos Metropolitan Area. H₀₃: There is no significant effect of federal railway modernisation programmes on multimodal integration in the Lagos Metropolitan Area.

This study holds both Academic Significance, Practical Significance and Policy Significance. It also adds to the existing body of literature on urban transport by assessing federal-level transit interventions within the context of an African megacity. In practice, it offers evidence-based information to transport planners and implementing agencies. In the case of policy, it provides suggestions on how to enhance federal strategies of mass transportation and improve intergovernmental coordination.

The scope of this study is defined in terms of content, geographical area, and time frame. In terms of content coverage (federal mass transit policies such as National Land Transport Policy, bus terminal projects, and railway programmes), Geographical coverage (Lagos Metropolitan Area that includes 20 Local Government Areas and 37 Development Areas of Lagos

State), and Time Frame coverage (2020-2026) covering recent policy changes and programme executions.

Methodology

This study adopted a mixed methods research design, comprising a quantitative survey and a qualitative documentary analysis. The quantitative survey design was employed to facilitate the systematic collection of data from a large sample of commuters, which can be statistically generalised to the rest of the population in the Lagos Metropolitan Area and documentary analysis in the study because it facilitates the triangulation of survey results with official records and policy documents, which offer contextual details and validity checks. The reasoning behind the design chosen is that mixed-methods enable triangulation of results to address the weaknesses of a particular method and are especially appropriate when research aims at policy evaluation because both quantitative measures of impact and qualitative contextual interpretation of policy are needed.

The target population of the study comprised daily commuters in Lagos Metropolitan Area, transport policy implementers and the transport infrastructure assets. Daily commuters are also relevant since they are the ultimate beneficiaries and users of federal mass transit programmes, and their perceptions are direct indicators of mobility outcomes. Policy makers (such as LAMATA officials, Ministry of Transportation employees, and bus operators) can be of interest as they can give first hand insights into the challenges and successes of the policy implementation. The transport infrastructure (bus stations, BRT lines, rail stations) is topical due to the direct impact of their condition, capacity, and dispersion on the urban mobility.

The estimated number of the total population of daily commuters in Lagos Metropolitan Area between 2011–2025 is presented below. Lagos has a population of about 26.4 million people, with about 8 million motorised movements each day. According to The Lagos State Transport Master Plan (Japan International Cooperation Agency [JICA], [2019](#)), it was estimated that the commuting population has been increasing at 25 per cent in every five-year time since 1965.

Table 1

Estimated Daily Commuting Population in Lagos Metropolitan Area (2011–2025)

Year	Estimated Daily Commuters (millions)	Annual Growth Rate (%)
2011	4.2	—
2012	4.5	7.1
2013	4.8	6.7
2014	5.1	6.3
2015	5.5	7.8
2016	5.9	7.3
2017	6.3	6.8
2018	6.8	7.9
2019	7.2	5.9
2020	6.5	-9.7 (COVID-19)
2021	7.0	7.7
2022	7.5	7.1
2023	7.8	4.0
2024	7.9	1.3
2025	8.0	1.3

Note. Lagos Bureau of Statistics ([n.d.](#)); Lagos State Transport Master Plan, JICA ([2019](#))

From the total population of 8 million daily commuters, the sample population was calculated with Krejcie & Morgan Sample Size Determination Formula. Using the total population from Table 1 above, the sample size is calculated as follows:

Krejcie & Morgan Formula: $s = X^2NP(1-P) \div [d^2(N-1) + X^2P(1-P)]$

Where: s = required sample size; X^2 = table value of chi-square for 1 degree of freedom at desired confidence level (3.841 for 95% confidence); N = population size (8,000,000); P = population proportion (assumed 0.50 for maximum variability); d = degree of accuracy expressed as proportion (0.05)

$$s = (3.841 \times 8,000,000 \times 0.5 \times 0.5) \div [0.05^2 \times (8,000,000-1) + 3.841 \times 0.5 \times 0.5]$$

$$s = (3.841 \times 8,000,000 \times 0.25) \div [0.0025 \times 7,999,999 + 3.841 \times 0.25]$$

$$s = (3.841 \times 2,000,000) \div [19,999.9975 + 0.96025]$$

$$s = 7,682,000 \div 20,000.95775$$

$$s = 384.09 \approx 384 \text{ respondents}$$

Stratified sampling (to divide the population into relevant groups like commuters by Local Government Area—Alimosho, Oshodi-Isolo, Ikeja, Surulere, Eti-Osa, and Mainland) followed by simple random sampling (to select respondents from the strata) was used for questionnaire administration. Purposive sampling was used to select key informants for interviews (LAMATA officials, Ministry of Transportation staff, bus operators). The chosen techniques are appropriate because stratification ensures representation across Lagos's diverse geographical and socioeconomic areas, random sampling within strata ensures each commuter has an equal chance of selection, and purposive sampling for key informants ensures that only individuals with relevant policy implementation knowledge are included.

The data for the study were sourced from primary sources which includes; questionnaire responses from commuters and semi-structured interviews with key informants. Secondary data were sourced from Academic journals (Google Scholar, ResearchGate, Scopus), panel data from LAMATA operational reports, National Bureau of Statistics transport bulletins, and policy documents including the Lagos State Transport Master Plan (JICA, [2019](#)). Primary data were obtained through field surveys conducted between January and March 2026 across selected BRT terminals, bus stops, and rail stations in Lagos Metropolitan Area.

The method of data collection consists primary and secondary methods; primary method consists of questionnaire administration and semi-structured interviews while the secondary method consists of documentary analysis of policy documents and statistical bulletins. The instrument of primary method is Questionnaire (for quantitative data) administered to 384 commuters across 10 Local Government Areas in Lagos. The questionnaire was structured, closed-ended, and used a Five-Point Likert Scale ranging from "Strongly Agree" to "Strongly Disagree" and "Very Effective" to "Very Ineffective". Semi-structured in-depth interviews with open-ended questions covering 15 participants (including 5 LAMATA officials, 5 transport operators, and 5 transport policy analysts) were used to compliment the questionnaire.

The study validity consists of Content and Face Validity confirmed by supervisor and expert panel comprising three transport researchers from University of Lagos Department of Urban and Regional Planning. The reliability process involved pilot testing of the questionnaire on 50 commuters in Ikeja Local Government Area (excluded from the main sample) using Cronbach's Alpha coefficient. The reliability test yielded a Cronbach's Alpha value of 0.87, exceeding the minimum acceptable threshold of 0.70, indicating high internal consistency of the instrument.

The study used both Descriptive and Inferential Statistics to present and analyse the quantitative data respectively. Descriptive statistics include frequency tables and percentages for presenting demographic and research question data. Data were presented using descriptive statistics (frequencies, mean, standard deviation) and inferential statistics was used to analyze the data. The hypotheses were tested using Multiple Linear Regression at a 5% level of significance. The Statistical Package for the Social Sciences (SPSS v.27) was used.

The Multiple Linear Regression model is stated as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Where:

Y = Urbanization Mobility

β_0 = constant or intercept

B 1, B 2, B 3 = independent variable coefficients.

X 1 = National Land Transport Policy (measured by commuter awareness, perceived effectiveness, and observed implementation)

X2 = Federal Bus Terminal Infrastructure Investment (measured by the improvements in the accessibility, the terminal utilisation, and the quality of the services)

X 3 = Federal Railway Modernisation Programme (measured in terms of rail ridership, mode integration and saved travel time).

e = error term

The regression model was used to test the significance of the effect of each independent variable on urban mobility by applying hypotheses of the study (H0 1, H0 2, H0 3).Content Analysis Technique consisting of

thematic coding and pattern identification was used to analyse the qualitative data from semi-structured interviews and documentary sources.

Ethical Concerns

The research followed the principles of ethical research. All survey respondents and interviewees were given informed consent before the study commenced; participants were fully informed on the purpose of the study that they can voluntarily withdraw at any time without any penalty. All respondents were ensured anonymity and confidentiality and no personally identifiable information was collected in questionnaires and interview transcripts were anonymised by participant codes. The ethical approval of the research ethics committee of the affiliated institution was obtained before fieldwork. Security measures in data storage were undertaken such as the use of passwords to store digital data and secure physical storage of paper questionnaires. Participants were not given any incentives or compensation to prevent coercion. The researchers did not deal with vulnerable groups (minors, prisoners, and individuals with cognitive impairments). Results are described in factual and sincere ways without inventions, falsification and biases.

Results

Table 2

Pre-study Trend Analysis Data (2007/2015): Lagos Public Transport Ridership (millions).

Year	BRT Ridership	Formal Bus Ridership	Rail Ridership (pre-Blue Line)
2007	0.8	12.5	0.0
2008	2.1	14.2	0.0
2009	3.5	15.8	0.0
2010	5.2	17.1	0.0
2011	7.8	18.4	0.0
2012	10.4	19.2	0.0
2013	12.1	20.5	0.0
2014	13.5	21.0	0.0
2015	14.2	20.8	0.0

Note. LAMATA Annual Reports (different years); Lagos Bureau of Statistics ([n.d.](#))

As indicated in the table, the trend data analysis: In 2007, the data indicated that the BRT ridership was low at 0.8 million passengers annually, which means that formal rapid transit had just begun in Lagos. Ridership grew to 2.1 million in 2008 after the launch of BRT. The BRT ridership as of 2010 arrived at 5.2 million and formal bus ridership of 17.1 million. BRT ridership increased to 7.8 million in 2011. It first exceeded 10 million in 2012. By 2013, the BRT had 12.1 million ridership. It rose to 13.5 million in 2014, and formal bus ridership was highest at 21.0 million. In 2015, BRT ridership was 14.2 million and formal bus ridership dropped a little to 20.8 million, perhaps related to the economy. During this time, rail ridership was at zero since the Blue Line was yet to be introduced.

Table 3

Study Period Trend Analysis Data (2016–2025)

Year	BRT Ridership (millions)	LBSL Bus Ridership (millions)	Blue Line Rail Ridership (millions)	Ferry Ridership (millions)
2016	15.1	22.5	0.0	0.8
2017	16.2	24.1	0.0	1.0
2018	17.5	25.8	0.0	1.2
2019	18.9	27.5 (May–Dec)	0.0	1.4
2020	12.0	15.2 (COVID-19)	0.0	0.6
2021	14.5	20.1	0.0	1.1
2022	16.8	28.4	0.0	1.5
2023	18.2	32.6	0.5 (Sept–Dec)	1.8
2024	19.5	35.2	1.2	2.2
2025	20.5 (est.)	38.0 (est.)	2.5 (est.)	2.8 (est.)

Note. Lagos State Government ([2025](#)); Adeniji ([2025](#))

The trend analysis presented in the table is as follows in the study period: In 2016, BRT ridership rose to 15.1 million and formal bus ridership to 22.5 million. As of 2017, BRT increased ridership to 16.2 million. In 2018, BRT had reached 17.5 million and bus ridership 25.8 million. Ridership was 27.5 million in 2019, as LBSL commenced service in May. Due to COVID-19 lockdowns, BRT ridership was plummeting in 2020 to 12.0 million, 37 per cent lower. Ridership had bounced back to 14.5 million in 2021. As of 2022, BRT had 16.8 million and bus ridership 28.4 million. As of 2023, with the opening of Blue Line rail in September, rail traffic

increased to 0.5 million within four months. As of 2024, the BRT had 19.5 million, bus 35.2 million and Blue Line rail 1.2 million ridership. By the year 2025, it is estimated that BRT will have 20.5 million riders, buses 38.0 million, Blue Line rail 2.5 million and ferry 2.8 million riders. The number of LBSA passengers passing in May 2019 to February 2025 cumulatively stood at 60,882,000 (Adeniji, [2025](#)).

Table 4

Model Summary

R	R^2	Adjusted R^2	Std. Error	Durbin-Watson
0.742	0.551	0.547	0.423	1.892

The predictors (National Land Transport Policy, Federal Bus Terminal Infrastructure Investment, and Federal Railway Modernisation Programme) and urban mobility are strongly correlated ($R = 0.742$) according to the model. About 55.1 per cent of the variance in urban mobility is explained by the model ($R^2 = 0.551$). The adjusted R^2 of 0.547 proves the good fit of the model as the adjusted R^2 of the model represents almost 55 per cent of the variance even after controlling the number of predictors. The Durbin-Watson statistic of 1.892 suggests no autocorrelation in the residuals, as the value is close to 2.

Table 5

ANOVA (Analysis of Variance)

	Sum of Squares	df	Mean Square	F	p
Regression	64.872	3	21.624		
Residual	52.802	338	0.156	138.456	0.000
Total	117.674	341			

The overall ANOVA model is statistically significant, with Sum of Squares value of 64.872, df (degree of freedom) of 3, Mean Square value of 21.624, F (F-ratio) value of 138.456, and Sig. value of 0.000. Since the p -value (0.000) is less than the significance level of 0.05, the regression model is statistically significant, indicating that the independent variables collectively have a significant effect on urban mobility.

Table 6*Coefficients*

	<i>B</i>	<i>SE</i>	β	<i>t</i>	<i>p</i>
Constant	0.823	0.114		7.219	0.000
National Land Transport Policy (X ₁)	0.156	0.048	0.198	3.250	0.001
Federal Bus Terminal Investment (X ₂)	0.198	0.052	0.235	3.808	0.000
Federal Railway Programme (X ₃)	0.421	0.044	0.456	9.568	0.000

The Constant shows the Unstandardized Coefficients of 0.823, Std. Error of 0.114, Standardized Coefficients (Beta) not applicable for constant.

Hypothesis One (H₀₁): There is no significant effect of the National Land Transport Policy on commuting efficiency in the Lagos Metropolitan Area. The result shows the unstandardized coefficient for X₁ (National Land Transport Policy) is 0.156 with a standard error of 0.048. The standardized Beta coefficient is 0.198, with a *t*-value of 3.250 and a statistically significant *p*-value of 0.001. The null hypothesis is therefore rejected because the calculated *p*-value of 0.001 is less than the estimated value of 0.05. The result of the hypothesis therefore revealed that there is a significant relationship between the National Land Transport Policy and commuting efficiency. It is concluded that the National Land Transport Policy has a positive and statistically significant effect on commuting efficiency in Lagos Metropolitan Area.

Hypothesis Two (H₀₂): There is no significant relationship between federal bus terminal infrastructure investment and public transport accessibility in the Lagos Metropolitan Area. The result shows the unstandardized coefficient for X₂ (Federal Bus Terminal Infrastructure Investment) is 0.198 with a standard error of 0.052. The standardized Beta coefficient is 0.235, with a *t*-value of 3.808 and a statistically significant *p*-value of 0.000. The null hypothesis is therefore rejected because the calculated *p*-value of 0.000 is less than the estimated value of 0.05. The result of the hypothesis therefore revealed that there is a significant relationship between federal bus terminal infrastructure investment and public transport accessibility. It is concluded that federal bus terminal investment has a positive and statistically significant effect on public

transport accessibility in Lagos Metropolitan Area.

Hypothesis Three (H_{03}): There is no significant effect of federal railway modernisation programmes on multimodal integration in the Lagos Metropolitan Area. The result shows the unstandardized coefficient for X_3 (Federal Railway Modernisation Programme) is 0.421 with a standard error of 0.044. The standardized Beta coefficient is 0.456, with a t -value of 9.568 and a statistically significant p -value of 0.000. The null hypothesis is therefore rejected because the calculated p -value of 0.000 is less than the estimated value of 0.05. The result of the hypothesis therefore revealed that there is a significant relationship between federal railway modernisation programmes and multimodal integration. It is concluded that the federal railway modernisation programme has the strongest positive and statistically significant effect on multimodal integration in Lagos Metropolitan Area, as indicated by the highest Beta coefficient (0.456) among all predictors.

Conclusion

The study concluded that the Mass Transit Policy and Programmes of Federal Government of Nigeria have had a significant positive influence on the urban mobility in Lagos Metropolitan Area. It further found that the National Land Transport Policy has contributed much to the efficiency of commuting by offering a well-coordinated regulatory system of formal operation of public transport. The study further concluded that the federal bus terminal infrastructure investment has improved public transport accessibility, especially to the suburban residents who had no access to organised transport services before.

Furthermore, the study established that the federal railway modernisation programme produces the most impact on multimodal integration, whereby the Blue and Red Line rail systems are changing the commuting patterns and are promoting modal shift off private cars and informal transport to formal rail transportation. Despite these achievements, there are still issues in maintenance quality, full multimodal integration and expansion to underserved regions.

Recommendations

Based on the above finding, the study recommends the followings:

- To enhance the implementation framework of the National Land

Transport Policy, the Federal Government ought to ensure that specific mechanisms of monitoring and evaluation are in place at the Lagos Metropolitan Area level, such as the quarterly performance reviews and the annual survey of commuter satisfaction to ensure that policy objectives are translated into actual improvements in commuting efficiency.

- Federal Ministry of Transportation ought to partner with the Lagos State Government and LAMATA to expedite the building of more bus terminals in suburban locations that are underserved such as Alimosho, Ikorodu, and Badagry, and ought to set special maintenance budgets to keep the current terminal facilities operational and safe.
- The Federal Government should expand railway modernisation programmes beyond the existing Blue and Red Lines by accelerating approvals and funding for the Green Line and Purple Line projects, and should prioritise the completion of physical and payment integration between rail, bus, and ferry services to achieve seamless multimodal transfers.
- LAMATA should intensify public awareness campaigns to increase commuter awareness of the Cowry card unified payment system and federal fare subsidy programmes, particularly targeting informal transport users to encourage modal shift to formal public transport.
- The National Assembly should enact legislation mandating that a minimum percentage of federal transport infrastructure budgets (recommended 15 per cent) be allocated to ongoing maintenance and operational subsidies, addressing the observed gap between infrastructure investment and maintenance quality.

Implications

Theoretical Implications

This study contributes to the existing body of knowledge by providing empirical evidence on the effectiveness of federal mass transit policies in a sub-Saharan African megacity context, an area previously under-researched relative to developed country transit evaluations. The study introduces a disaggregated framework linking specific federal policy instruments (National Land Transport Policy, bus terminal investment, railway modernisation) to specific urban mobility outcomes (commuting efficiency,

accessibility, multimodal integration). The study also contributes methodologically by demonstrating the applicability of mixed-methods design and the Theory of Planned Behaviour framework to transport policy evaluation in developing country contexts.

Practical Implication

The implications of the findings to the transport policymakers, the implementing agencies, and development partners are practical. In case of the Federal Ministry of Transportation, the positive impact of the National Land Transport Policy is very high, which can justify the policy direction and support further implementation and funding. In the case of LAMATA, the effect of modernisation of the railway is very strong, and this implies that the further investment in rail growth should be prioritised. When it comes to development partners (World Bank, AFD, EU, EIB), the results would justify future funding of Lagos transport projects because of the proven positive effects.

Author Contribution;

Nasir Olarewaju Ayilara: writing – original draft, methodology, formal analysis, writing – review & editing. **Musa Zakari:** writing – original draft, methodology, formal analysis, writing – review & editing.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

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Data supporting the findings of this study will be made available by the corresponding author upon request.

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