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BEYOND DEDICATED LANES: EVALUATING OPERATIONAL REALITIES AND PATRONAGE OF BUS FRANCHISE SCHEMES IN LAGOS METROPOLIS

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Abstract

This study assesses the operational realities and patronage trends of the Bus Rapid Transit (BRT) and Lagos Bus (LAGBUS) systems in Lagos Metropolis, aiming to identify key performance indicators and user determinants that can inform service enhancements. Using a mixed-methods approach, primary data were collected through field observations, structured questionnaires for passengers and operators, and interviews. Secondary data were obtained from official records of the Lagos Metropolitan Area Transport Authority (LAMATA) and LAGBUS. We surveyed 330 passengers and 87 drivers at certain bus stops and operational zones. Descriptive statistics, chi-square tests, and multivariate factor analysis were used to look at socio-economic characteristics, service frequency, waiting and dwelling times, and things that affect passenger choice. The results show that both systems mainly serve low-income, working-age commuters who rely heavily on public transportation. However, there are some important differences in how the systems work and who uses them. BRT passengers wait less time and care more about safety, reliability, and system identity. LAGBUS passengers, on the other hand, wait longer but get more frequent services and more buses. BRT usually has longer dwell times because it takes longer for people to board. Factor analysis shows that safety and reliability at the system level are the most important reasons why people use BRT. At the service level, frequency, convenience, and capacity are the most important reasons why people use LAGBUS. The study finds that both schemes are essential for urban mobility in Lagos, but their operational inefficiencies, especially limited fleet capacity, long wait times, and unreliable service, put their ability to meet the growing demand from commuters at risk. To improve service quality and keep ridership in Nigeria's rapidly urbanizing megacity, it is suggested that targeted improvements be made in fleet expansion, operational management, safety measures, and intermodal integration.

Keywords: operational realities, patronage, BRT, LAGBUS, Lagos state

Introduction

The progress of a country is primarily dependent on its development, which is crucial in providing its population with a high standard of living. Nevertheless, in order for a nation to embark on a road of development, it must fulfil key prerequisites, such as obtaining socio-political and economic stability (Lawal & Abe, 2011). A significant element contributing to economic possibilities is the existence of a well-established transportation infrastructure capable of serving mobility demands and guaranteeing accessibility to markets and resources (Aderibigbe & Gumbo, 2024). The sustainability of the economy, society, and the environment of transportation supports the growth and growth of a region or a nation (Prus & Sikora, 2021)

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Inadequate land use transport planning, an ineffective public transportation system, and a badly maintained urban road network and road auxiliary facilities are some of the current manifestations of urban transport issues (Aderamo and Salau, 2013). Furthermore, increasing urbanisation in Global South cities leads to serious difficulties such as land scarcity, unplanned informal settlements, insufficient facilities, and a worsening urban environment. Lagos, as one of the major megacities, faces high traffic congestion and shortfalls in effective public transport systems such as buses and rail mass transit (Arku & Marais, 2021). Lagos State is still Nigeria's commercial hub and has ultimately grown to be the country's most urbanised state. However, the expansion of Lagos has led to a population boom, significant unemployment, shortfalls in infrastructure, frequent disturbance by miscreants, traffic congestion, inadequate sanitation and waste management problems among other concerns (Chidi & Badejo, 2024).

Bus Rapid Transit (BRT) is a transport option which focuses on the usage of dedicated free segregated lanes to guarantee speedy and reliable bus travel. It is a high-performance public transit bus service which combines bus lanes with high-quality bus stations, vehicles, facilities and branding to reach the efficiency and standards of a commuter rail or metro system, with the flexibility, cost and simplicity of a bus system (Aderinlewo et al., 2020). Locally, the system is also described as an excellent, reasonably priced bus system that maintains as many of the best BRT features as possible (Yaqub et al., 2012). BRT system offers reduced traffic congestion as well as offers economical and quality services to the low and middle-class populations. It also offers a speedy journey within a reliable travel time. It avoids long lineups at bus stations, offers clean buses of superior quality and reduces the number of unregulated public transport vehicles on the road (Aderinlewo et al., 2020).

For many years, Lagos has faced significant issues related to road traffic, urban mobility, congestion, and environmental pollution. To lessen this issue, the Bus Rapid Transit (BRT) program was implemented (Amiegbebhor and Dickson, 2014). Through a private partnership called Lagos Bus (LAGBUS), LAMATA established Africa's first Bus Rapid Transit (BRT) scheme in an effort to decrease the number of vehicles on Lagos Road and lessen the threat posed by commercial bus drivers in Lagos State. The program started operating in Lagos, Nigeria, on March 17, 2008. The advent of LAGBUS offers a singular chance to alter unfavorable opinions about public transportation in Lagos State and manage the problems commuters face, including those of safety, comfort, insecurity, fairness in transportation costs, travel duration, and waiting facilities (Osoja et al., 2023; Oguntimehin & Oshikomaiya, 2022).

However, the way that BRT and LAGBUS operate in Lagos has not been able to meet the expectations of system users in terms of moving passengers from one location to another (Amiegbebhor & Boluwatife, 2018). Long wait times for passengers at the various bus stations of the two mass transit systems are caused by the lack of buses and traffic conditions that cause the buses to arrive late. There is still a significant lack of empirical research on the specific operational realities, such as waiting times, service frequency, and operator perspectives within Lagos bus franchise schemes, despite the fact that BRT systems in Lagos and other African cities have drawn a lot of attention from studies that concentrate on infrastructure development and broad service impacts (Otunola, 2019; Chitauka, 2014). Although studies have shown how operational issues, including vehicle

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availability, budgetary limitations, and service management, impact Lagos BRT performance, there is a dearth of comparable information on the day-to-day service dynamics of various bus franchise operators (Otunola, 2019). Additionally, little research has been done expressly to examine the factors that influence user satisfaction and patronage in urban transportation contexts in Nigeria or other African countries. This limits our knowledge of demand-side elements that affect ridership, such as comfort, accessibility, and dependability (Kariuki, 2020). Based on the above, this research will provide answers to the following questions;

1. Who are the passengers of the BRT and LAGBUS systems in the Lagos metropolis?
2. What are the service frequencies of the systems in the study area?
3. Who are the operators of the systems in the study area?
4. How long is the waiting time of the passengers at the bus stops/major stations in the study area?
5. How long is the dwelling time of the buses at bus stops/loading points of the systems in the study area?
6. What are the factors influencing the choice of BRT and LAGBUS in the study area?

In order to provide information that could improve the operation of the transport systems in the research region, the purpose of this study is to particularly assess the operation and patronage of the LAGBUS and Bus Rapid Transit (BRT) systems in Lagos Metropolis. By experimentally investigating how operational performance such as waiting times, service dependability, and route coverage influences mode choice and patronage of the BRT and LAGBUS systems in Lagos, this work advances the field of urban transport literature. It provides evidence to assist policies targeted at increasing service efficiency, infrastructure maintenance, and the overall quality of mass transportation in similar developing-city environments by connecting user behavior with system operations in a fast growing megacity.

Literature Review

Conceptual Foundation

In recent years, public transportation in cities has drawn more attention as a means of enhancing sustainability and the standard of living in metropolitan areas. By efficiently connecting resources to destinations and promoting mass mobility, cities can improve their economic and environmental performance (Abdallah, 2023). Bus Rapid Transit (BRT), which integrates stations, cars, and technologies into a superior rail-like service, has grown in popularity as a transit option for cities all over the world throughout the past 20 years. Like other transit systems, BRT is anticipated to increase urban mobility while also providing communities with economic advantages and land development prospects (Zhang & Yen, 2020). Since the first BRT system was installed in Curitiba, Brazil, in 1977, its use has grown rapidly, primarily due to the promise of better, faster, and less expensive public transportation at a fraction of the price of a subway or heavy rail system (Basso et al., 2019).

According to Otunola, Kriticos, and Harman (2019), Lagos was among the major global cities without a structured public transportation system before the Bus Rapid Transportation System (BRT) was put into place in 2008. The authors claim that 75,000 privately owned minibuses (danfo) and a smaller number of midi-buses (molue), tricycles (also known as "Keke-Napep"), motorbikes (Okada), and shared taxis provided the

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majority of shared transportation services. The research went on to say that in 2008, informal buses made up about 69% of all motorized trips and that they are still crucial to the flow of people and goods across Lagos. Notwithstanding their transportation benefits, they suffer from a number of problems, such as poor safety regulations, loose regulations, a poor maintenance culture, insecurity, and a disregard for traffic laws. Due to the prolonged domination of these unofficial transportation options, commuters have gradually become accustomed to the poor service quality to the point where they occasionally have low expectations for the new public transportation options (Oguntimehin & Oshikomaiya, 2022).

Through a private partnership called Lagos Bus (LAGBUS), the Lagos State Government launched bus rapid transit (BRT) in an effort to increase commuters' or passengers' mobility from one location to another. Bus rapid transit (BRT) provides passengers with a frequent, quicker, and less congested ride by operating high capacity buses on designated bus corridors. The establishment of LAGBUS offers a singular chance to alter unfavorable opinions about public transportation in Lagos State and manage the problems commuters face with regard to comfort, safety, insecurity, fairness in transportation costs, travel duration, and waiting facilities (Oguntimehin & Oshikomaiya, 2022).

Determinants of Public Transport Patronage

Without a doubt, the need for public transit is derived. Access to markets, education, leisure and tourism, healthcare, employment prospects, and other vital services are all made possible by transportation, which has a significant influence on the expansion and development of metropolitan areas. One of the most important prerequisites for sustainable growth and development is better mobility for the urban poor and vulnerable, particularly in the cities of less developed nations (Ogundare & Ndulue, 2020). One major obstacle to the social and economic development of Nigerian metropolitan areas is the sharp rise in demand for public transportation. Lagos, the nation's commercial center, faces numerous difficulties, one of which is an insufficient public transportation system. Although the city is still the smallest state in the nation in terms of geographic size, with an estimated 17 million residents in 2006, the public transportation system is overburdened (Olabosinde et al., 2023).

People who plan trips and commute are seen to be logical creatures who select the kinds of transportation that will be most useful to them. There is no denying that a variety of factors affect which public transportation service provider is preferred. Fare, travel time (walk access time, accessibility of transport, waiting time, in vehicle (journey) time), service quality, comfort, reliability, availability and costs of alternative travel modes, time of travel, purpose of travel, and finally the degree of reliance on public transportation are the factors that Polat (2012) has identified as determining demand for public transportation. It is evident that additional elements beyond those listed above are important in this regard. For instance, the researchers think that travelers' perceptions of a transport service provider's safety and security orientation may also actively influence their choice of service provider (Lois et al., 2018).

One of the key elements influencing the decision to take one kind of public transportation over another is travel time. It is significant since passengers are unable to extend their trip

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duration forever (Sam et al., 2014). Travel time consists of "multiple components within the public transport frame," according to Polat (2012, p. 1216). The three primary components of travel time are walking (or access) time, waiting time, and traveling (in vehicle) time. For travelers, each of these elements has a unique significance. Many of these cost components, such as access times to service points and final destinations, waiting times at stops and interchanges, and travel times at vehicles, are included in the price for a typical public transportation user, according to Sam et al. (2014). These factors taken together have an impact on how travelers evaluate public transportation services.

According to Khan et al. (2021), improving governance conditions and service quality—like dependability, safety, and frequency—are crucial preconditions for boosting public transportation use worldwide. On the other hand, Tennøy et al. (2022) provided empirical evidence that supports operational quality as a factor by demonstrating that improvements in waiting time, service frequency, and reliability positively increase ridership in local public transportation systems. In eight Norwegian cities with populations ranging from 12,000 to 118,000, they examined cases where bus services were reorganized into fewer, straighter, faster, and simpler routes with higher frequencies. In some places, walking distances to stops increased, and services were cut on less-traveled routes. Patronage increased by 3.3% to 17.1% annually during the evaluation periods after the adjustments in all cases. The gains were more than the overall growth in bus patronage in similar Norwegian cities and greater than the population growth in the cities, and they followed periods of lower patronage growth or decline. Based on this, it was determined that the interventions made by the public transportation service were the reason for the increase in passengers.

Operational Performance of BRT

In order to alleviate urban transportation issues such as traffic congestion and insufficient public transit services, Bus Rapid Transit (BRT) systems have been extensively deployed throughout the world as an affordable substitute for metro rail systems. In order to create performance metrics such as average delays, schedule adherence, and travel durations across dedicated and non-dedicated lanes, a thorough analysis of the Indianapolis BRT system used trajectory-based data. According to the study, dedicated lanes provide for quicker travel times than regular traffic, particularly during rush hours. However, timetable adherence is still difficult because of operational conditions. Intersection delays and suggested scheduling and transit signal priority (TSP) changes were emphasised in the analysis as possible ways to increase operational reliability (Mathew et al., 2022). According to Andrew et al.'s (2022) Bayesian operational evaluations of BRT in Dar es Salaam, system management and route optimisation have a direct impact on passenger numbers and trip time reductions, highlighting the significance of effective operational planning. The whole passenger experience is impacted by dwell times and service frequency, which are impacted by fleet size, depot capacity, and infrastructure maintenance issues that African cities face.

Although research indicates limitations like restricted accessibility, station insecurity, and poor integration with other modes of transportation, Lagos State's BRT system has demonstrated favorable impacts on urban mobility in the African environment. Despite increased service frequency and travel speed in dedicated lanes, these restrictions reduce the system's operational efficacy. Consistent with findings in other Global South cities,

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passenger surveys conducted in Lagos highlight the importance of comfort, safety, and dependability in boosting user satisfaction and riding (Lasisi et al., 2022).

Studies in Nigeria and Lagos State

One of the largest urban transport systems in West Africa is the Lagos BRT system, which is run by the Lagos Metropolitan Area Transport Authority (LAMATA). Lasisi et al. (2022) claim that BRT has greatly increased travel speeds along its designated routes when compared to traditional mode options, cutting commuters' journey times in one of the world's fastest-growing cities. However, because of overcrowding and a small fleet, operational delays still happen, particularly during peak hours, which affects the reliability of travel times and regular service frequency. High service frequency and short wait times are essential for drawing in and keeping passengers, according to research. Lagos BRT passenger satisfaction is impacted by a number of variables, such as safety concerns, overcrowding, and poor integration with other means of transportation, even if recent upgrades and the implementation of digital payment systems have increased operating efficiency. According to user views, to maintain and increase patronage, complete operational management that prioritises schedule reliability, safety, and comfort is necessary (Lasisi et al., 2022; Adebambo & Adebayo, 2009).

The BRT system offers quantifiable travel time reductions and increased service frequency, but sustained improvements necessitate resolving operational issues with overcrowding, security, and integration, according to an empirical study from Lagos State. To maximise operational performance and raise passenger happiness, effective management techniques, technological advancements, and infrastructure investments are essential. Few studies incorporate operator data and comparative analysis with LAGBUS; most existing research has assessed BRT performance from the viewpoint of the passenger. This study fills this knowledge gap by assessing the performance and user base of the Lagos Metropolis's Bus Rapid Transit (BRT) and LAGBUS systems using both quantitative and qualitative methods.

Methodology

Data Sources

We used both primary and secondary data. Field observation, direct interviews, and two structured questionnaires were used to get primary data. The first survey was for people who used the BRT and LAGBUS systems and asked about their socio-economic status, how long they had to wait, how long it took to board and get off, and how they traveled. The second questionnaire was given to system operators (drivers and pilots) to get information about things like route coverage, service frequency, operating speed, years of experience, and dwelling time. The Lagos Metropolitan Area Transport Authority (LAMATA), LAGBUS Asset Management Ltd., and other relevant agencies provided secondary data such as route maps, fleet size, ticket sales, and operational rules.

The sampling frame included all of the BRT bus stops along the dedicated corridor, the main loading points in the six LAGBUS operating zones, passengers who were on board during peak morning hours, and drivers who were currently working in both systems. For the BRT, six of the fourteen bus stops (40%) were chosen at random. For the LAGBUS, three of the six operational zones (50%) were chosen in the same way. During the morning rush hour (06:00–09:00), passengers were systematically approached at each chosen stop or

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zone and asked to fill out a survey. Simple random selection was used to choose drivers from the main depots of each system.

For the BRT, 180 passengers (30 per stop) and 48 drivers (10% of the 484 registered pilots) filled out questionnaires. For LAGBUS, 150 passengers (30 from each chosen loading point) and 38 drivers (10% of the 382 registered captains) were asked questions. The study included 330 passengers and 87 drivers.

We used descriptive statistics (frequencies and percentages) to summarise the socio-economic profiles of passengers and the characteristics of operators. We used frequency distributions and chi-square tests to look at operational patterns like fare collection, dwell time, travel speed, and boarding and alighting behaviour. Multivariate factor analysis was used to find out what factors affect patronage and system performance. These factors included service quality, waiting time, frequency, fare stability, comfort, safety, and the availability of other modes of transportation.

Result and Discussion

Passengers of BRT and LAGBUS in Lagos Metropolis

According to table 1, the majority of the passengers served by the Bus Franchise Schemes (BRT and LAGBUS) in Lagos Metropolis are young, working-age passengers, according to the analysis of data gathered on the socioeconomic characteristics of these passengers. 51.3% of LAGBUS riders are between the ages of 21 and 30, and 36.3% are between the ages of 31 and 40. Similarly, 63.9% of BRT riders are between the ages of 21 and 30, and 26.1% are between the ages of 31 and 40. The gender distribution in both systems is comparable, with roughly two-thirds of the population being male. According to research by Amiegbebhor and Boluwatife (2018), BRT users have a male-to-female ratio of 1.33, which is higher than the general population ratio of 1.11 in Lagos. Among LAGBUS passengers, there are more married people (50% married compared to 31.8% for BRT) and fewer single people (50% compared to 68.2%). Compared to BRT users, who have 61.7% tertiary degrees, LAGBUS users have 84.0% more. Comparable occupational profiles show that approximately half of riders in both systems are employed in the private sector (47%), followed by independent contractors, public servants, and students. In general, BRT and LAGBUS users are generally well-educated, low-wage workers or students without cars, while LAGBUS users tend to be slightly older, married, and better educated.

The reported average monthly income of LAGBUS and BRT passengers is contrasted in Figure 1. The vast majority (73.9%) of the 180 BRT respondents said they made less than ₦50,000 a month, followed by ₦50,000–100,000 (24.4%) and ₦100,000 (0.6%). Just 1.1% of respondents said they had no income. The 150 LAGBUS passengers, on the other hand, had a somewhat higher income distribution: 55.3% made less than ₦50,000, 43.3% made between ₦50,000 and ₦100,000, 0.7% made more than ₦100,000, and 0.7% made nothing at all. These findings are in line with research by Oluwakoya (2024), who found that low-income populations are the main beneficiaries of BRT systems. About 70% of BRT commuters make less than ₦100,000 per month, according to the study, demonstrating the system's ability to assist those from low-income backgrounds.

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Table 1:
Socio-economic characteristics and demography of BRT and LAGBUS passengers in Lagos Metropolis

Characteristic	BRT passengers frequency	BRT passengers (%)	LAGBUS passengers frequency	LAGBUS passengers (%)
Age				
Age 21–30	115	63.9	75	51.3
Age 31–40	47	26.1	53	36.3
Age 41–50	12	6.7	16	11.0
Age 51-60	6	3.3	2	1.4
Total	**180**	**100**	**146**	**100**
Gender				
Male	118	65.6	98	65.3
Female	62	34.4	52	35.7
Total	**180**	**100**	**150**	**100**
Marital Status				
Single	118	68.2	74	50
Married	55	31.8	74	50
Total	**173**	**100**	**148**	**100**
Educational background				
No formal education	7	3.9	3	2.0
Primary education	12	2.7	1	0.7
Secondary education	50	27.8	20	13.3
Tertiary education	11	61.7	126	84.0
Total	**180**	**100**	**150**	**100**
Occupation				
Unemployed	4	2.2	5	3.3
Students	15	8.3	16	10.7
Private-sector employment	84	46.7	71	47.3
retired	4	2.2		
Self-employed	49	27.2	28	18.7
Civil servant	21	11.7	30	20.0
others	3	1.7		
Total	**180**	**100**	**150**	**100**

Source: Author's field survey (2015)

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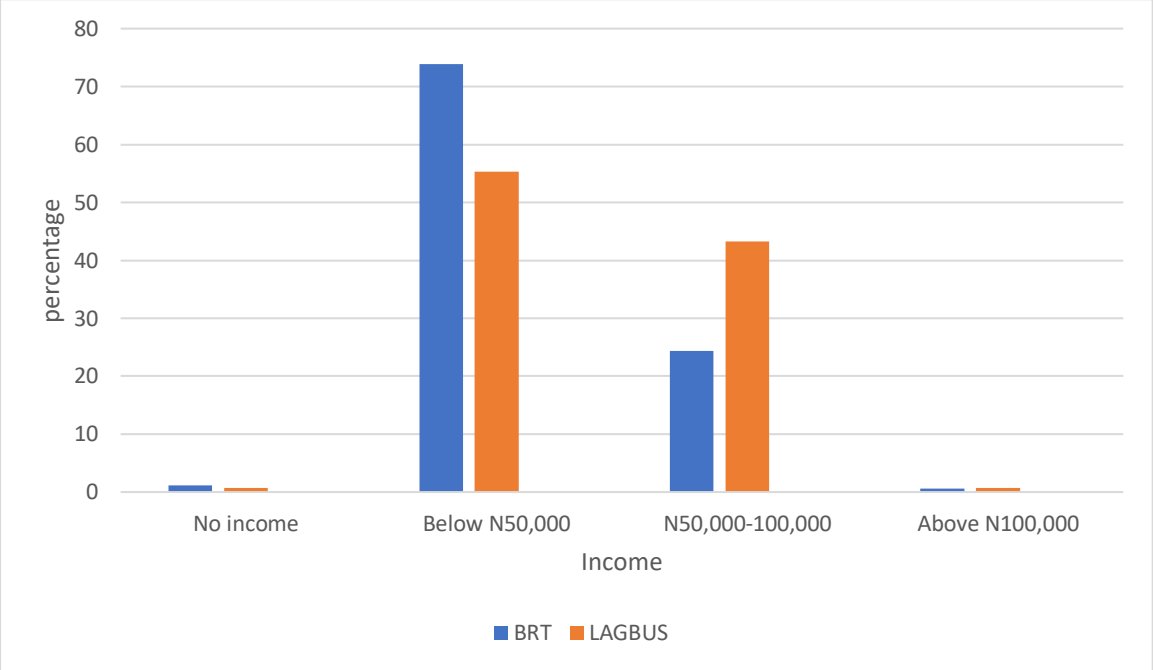

Figure 1: Monthly income earned between BRT and LAGBUS passengers

Car ownership is low among passengers of both systems as depicted in table 2, reflecting their reliance on public transport. Among BRT riders (n = 180), 90.0% reported no car, while 8.9% owned one car and 1.1% owned two cars. Similarly, among LAGBUS passengers (n = 150), 88.7% reported no car, 9.3% owned one car, and 2.0% owned two cars.

Table 2:
Car ownership among passengers of BRT and LAGBUS in Lagos Metropolis

Car ownership	BRT passengers (%)	LAGBUS passengers (%)
No car	90.0	88.7
One car	8.9	9.3
Two cars	1.1	2.0
Total	**100**	**100**

Service Frequency of BRT and LAGBUS

Quantitative data analysis reveals that LAGBUS operates more frequently. As table 3 illustrates, the vast majority of LAGBUS drivers (63.2%) report making 6–10 trips daily, compared to 47.9% of BRT drivers. In line with this, LAGBUS passengers frequently see several buses waiting; when they reach a stop, 69.3% of LAGBUS riders say they see two buses available, compared to just 28.9% of BRT riders. By comparison, only one bus is reported by 30.0% of BRT users (compared to 17.3% for LAGBUS). Therefore, compared to the BRT corridor, LAGBUS seems to offer a higher on-road vehicle frequency. This result is in line with Ogundare's (2023) research. which discovered that BRT bus frequency is too low, resulting in passenger delays and crowding.

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Table 3:
Service frequency of BRT and LAGBUS in the Lagos metropolis

Daily trips made by Drivers	BRT Frequency	BRT Percentage	LAGBUS Frequency	LAGBUS Percentage
1 – 5 trips	25	52.1	14	36.8
6 – 10 trips	23	47.9	24	63.2
Total	**48**	**100.0**	**38**	**100.0**
Number of available buses				
1	54	30.0	26	17.3
2	52	28.9	104	69.3
3	43	23.9	14	9.3
Others	31	17.2	6	4.0
Total	**180**	**100.0**	**150**	**100.0**

Operators of the Systems (Bus Drivers)

Although there are very few women (0% vs. 5.3%) on LAGBUS and none on BRT, the majority of drivers (also known as "operators") on both systems are men. Table 4. This outcome is indicative of larger gender trends in Nigerian transportation. According to research on gender dynamics in Nigerian transportation by Mensah (2025), women face major obstacles as transport operators, and the industry is still heavily dominated by men. Whereas 60.5% of LAGBUS drivers are under 40, BRT drivers are a little older—just 8.3% are under 30. In both systems, married drivers make up the majority (89.6% in BRT and 81.6% in LAGBUS). Figure 2 shows that while 13.2% of LAGBUS drivers lack formal education (only 23.7% have a tertiary degree), BRT drivers are generally more qualified, with all having at least a secondary certificate and 39.6% having tertiary degrees. The educational disparities that indicate BRT drivers are better qualified align with formal sector employment requirements in Lagos State's public transportation system (Ogundare & Ndulue, 2020). Both groups earn modest monthly salaries. For instance, 76.3% of LAGBUS drivers make between ₦21 and ₦40k, whereas 79.2% of BRT drivers make between ₦31,000 and ₦40,000. The majority of the drivers in both fleets are middle-aged men. BRT drivers are typically male, a little older, and better educated.

Table 4:
Characteristics of BRT and LAGBUS operators

Gender	BRT Frequency	BRT Percentage	LAGBUS Frequency	LAGBUS Percentage
Male	48	100	36	94.7
Female	0	0	2	5.3
Total	**48**	**100.0**	**38**	**100.0**
Age				
21 – 30	4	8.3	4	10.5
31 – 40	18	37.5	19	50.0

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41 – 50	20	41.7	6	15.8
51 – 60	6	12.5	5	13.2
61 - 70	-	-	4	10.5
Total	**48**	**100.0**	**38**	**100.0**
Marital Status				
Single	5	10.4	6	15.8
Married	43	89.6	31	81.6
Divorced	-	-	1	2.6
Total	**48**	**100.0**	**38**	**100.0**
Average monthly income				
#11,000 - #20,000	-	-	4	10.5
#21,000 - #30,000	-	-	14	36.8
#31,000 - #40,000	38	79.2	15	39.5
#41,000 - #50,000	10	20.9	4	10.5
#51,000 - #60,000	-	-	1	2.6
Total			**38**	**100.0**

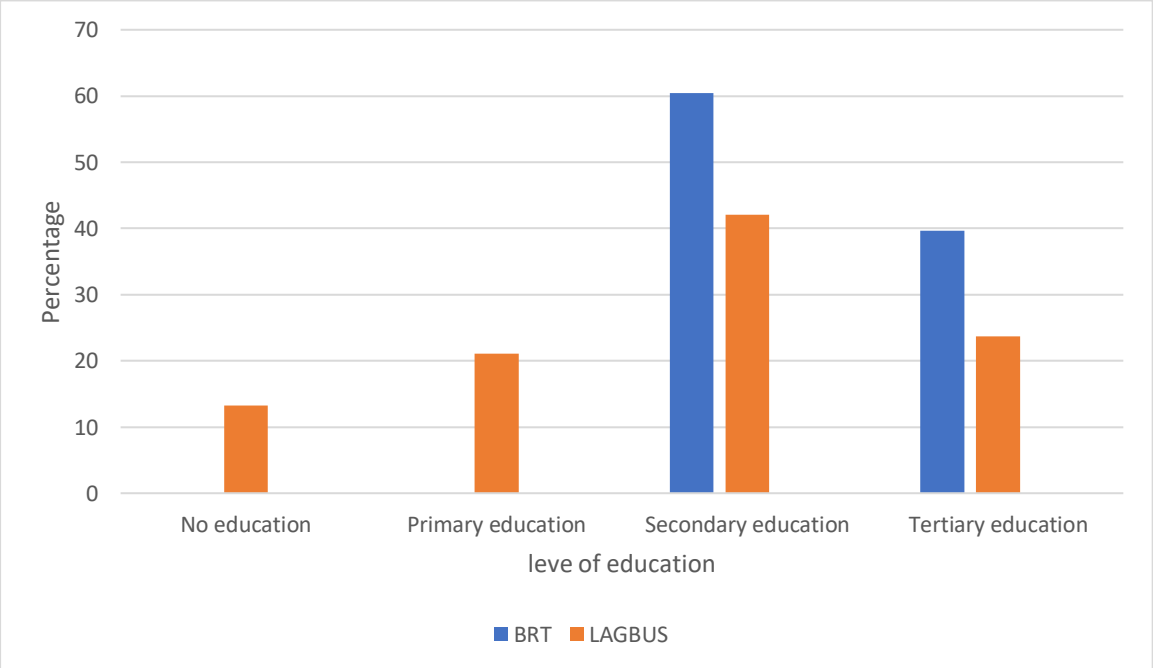

Figure 2. Educational level of BRT and LAGBUS drivers

Passengers Waiting Time at Stops

Compared to LAGBUS users, BRT users experience shorter wait times. While 32.0% of LAGBUS passengers report waiting more than 35 minutes, only 6.1% of BRT passengers do the same. On the other hand, only 27.4% of LAGBUS users wait 15 minutes or less

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(4.7% <5 min, 22.7% 6-15 min), compared to 42.2% of BRT users (8.3% <5 min, 33.9% 6-15 min). As a result, the BRT has a shorter median waiting time. A significant portion of users on both systems wait between 16 and 25 minutes (26.1% BRT, 34.7% LAGBUS); however, very long waits (>25 minutes) are much more frequent on LAGBUS (32.0% >35 min) than on BRT (6.1%). Research indicates that 80–90% of Nigerians who use public transportation encounter real waiting times ranging from 21 minutes to more than an hour, indicating that waiting time perceptions can be problematic (Ibrahim & Ede, 2023). 72% of passengers wait more than an hour during off-peak hours, according to recent research on BRT station overcrowding by Olorunnimbe et al. (2025), indicating persistent issues.

Table 5:
Passengers' waiting time at stops of BRT and LAGBUS stations

Average waiting time	BRT Frequency	BRT Percentage	LAGBUS Frequency	LAGBUS Percentage
< 5 minutes	15	8.3	7	4.7
6 – 15 minutes	61	33.9	34	22.7
16 – 25 minutes	47	26.1	52	34.7
26 – 35 minutes	46	25.6	9	6.0
Above 35 minutes	11	6.1	48	32.0
Total	**180**	**100.0**	**150**	**100.0**

Bus Dwelling Time at Stops/Loading Points

Additionally, boarding (dwelling) times vary. While most buses on both systems stay in place for 11 to 20 minutes, 31.3% of BRT buses stay in place for 21 to 30 minutes, compared to just 10.5% of LAGBUS buses. In contrast, 60.4% of BRT buses clear in 11–20 minutes, while 78.9% of LAGBUS buses do so. On both systems, only 8–10% of buses complete boarding in less than 10 minutes. In sum, BRT vehicles typically spend longer (often >20 min) at stops than LAGBUS vehicles. According to research, because of fare collection and passenger flow management, formal BRT buses frequently have longer dwell times at stops (Rashidi et al., 2023)

Table 6:
Dwelling time at stops/loading points of BRT and LAGBUS

Dwelling time at the bus stop	BRT Frequency	BRT Percentage	LAGBUS Frequency	LAGBUS Percentage
Less than 10 minutes	4	8.3	4	10.5
11 – 20 minutes	29	60.4	30	78.9
21 – 30 minute	15	31.3	4	10.5
Total	**48**	**100.0**	**38**	**100.0**

Factors Influencing Choice of BRT vs LAGBUS

A five-point Likert scale (1 being strongly disagree and 5 being strongly agree) was used to gauge passengers' opinions of seven possible factors that could affect BRT and LAGBUS performance. Each rating was weighted, and the sum of the weight values (SWV) was divided by the total number of responses to create a Passengers' Agreement Index (PAI).

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For BRT buses, the mean PAI for all seven factors was 3.44, suggesting a moderate degree of agreement that the factors identified have an impact on system performance. Table 7 indicates that the highest agreement was obtained by capacity (PAI = 3.65, deviation = +0.21), followed by safety and security (3.53, +0.09), convenience (3.57, +0.13), and identity and image (3.62, +0.18). These four variables were found to be the most significant determinants of perceived BRT performance because they all had positive deviations from the mean. On the other hand, travel time (2.96, -0.48), service satisfaction (3.36, -0.08), and reliability (3.40, -0.04) all showed negative deviations, with travel time being the least significant factor. Salome (2025) asserts that safety, responsiveness, comfort, convenience, and dependability all have a major impact on how satisfied passengers are with BRT services. She also asserted that aspects like convenience and dependability have strong positive correlations with perceived service quality, which has a substantial impact on passenger satisfaction.

Table 7:
Passengers' level of agreement index factors of performance characteristics of BRT system

BRT performance rate	Rating and weighted value							Mean Deviation
	SD (1)	D (2)	JA (3)	A (4)	SA (5)	SWV	PAI	PLAI – $\overline{PLAI}$
Capacity	15	24	123	260	235	657	3.65	**+ 0.21**
Identity and image	9	38	117	308	180	652	3.62	**+ 0.18**
Convenience	15	42	99	272	215	643	3.57	**+ 0.13**
Safety and security	19	22	123	292	180	636	3.53	**+ 0.09**
Reliability	9	44	186	248	125	612	3.40	**- 0.04**
Satisfactory	10	58	159	252	125	604	3.36	**- 0.08**
Travel time	31	56	147	220	85	539	2.96	**- 0.48**
Total								
						∑PAI= 24.09		

SD: strongly disagree, D: disagree, JA: just agree, A: agree, SA: strongly agree, SWV: summation of weight value, PAI: Passenger agreement index.

A moderate degree of agreement that the identified factors affect system performance was indicated by LAGBUS's overall mean PAI across all factors, which was 3.33. Five of the seven variables had positive deviations from the mean, indicating a comparatively strong influence on LAGBUS performance, as Table 8 illustrates. The most significant factor was safety and security (PAI = 3.68, deviation = +0.35), which was followed by reliability (3.33, +0.00), capacity (3.37, +0.04), convenience (3.60, +0.27), and identity and image (3.60, +0.27). On the other hand, travel time (2.55, -0.78) and service satisfaction (3.16, -0.17) both displayed negative deviations, with travel time by far the least significant attribute. This finding is consistent with Mchome & Nzoya's (2023) research, which showed that safety perceptions have a major influence on the modes of transportation that African urbanites choose. In line with the findings of our factor analysis, the Birago et al. (2017) study affirms that the main factors influencing the choice of paratransit system are frequency, availability, and convenience.

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Table 8:
Passengers' level of agreement index factors of performance characteristics of the LAGBUS system

LAGBUS performance rate	Rating and weighted value							Mean Deviation
	SD (1)	D (2)	JA (3)	A (4)	SA (5)	SWV	PAI	PLAI – $\overline{PLAI}$
Safety and security	2	12	183	196	160	553	3.68	**+ 0.35**
Identity and image	7	40	102	216	175	540	3.60	**+ 0.27**
Convenience	5	28	147	200	160	540	3.60	**+ 0.27**
capacity	11	32	156	196	110	505	3.37	**+ 0.04**
Reliability	23	24	105	212	135	499	3.33	**0.00**
Satisfactory	20	60	81	204	110	475	3.16	**- 0.17**
Travel time	10	36	159	68	110	383	2.55	**- 0.78**
Total								
						∑PAI= 23.29		

SD: strongly disagree, D: disagree, JA: agree, A: agree, SA: strongly agree, SWV: summation of weight value, PAI: Passenger agreement index.

Several attribute clusters influence mode choice, according to a factor analysis of passenger surveys. The "system" factor, which encompasses aspects such as safety, dependability, and the professionalism of the drivers, was found to have the greatest impact on BRT patronage. On the other hand, the "service" component frequency, availability, and convenience of service hours dominate LAGBUS selection. To put it another way, LAGBUS riders place more emphasis on service-level elements like capacity and frequency, while BRT riders prioritise system-level features like security and consistent operations. For each system, these key factors are ranked behind subsequent elements, such as provision and operational factors. In contrast to informal and semi-formal system selection, which is influenced by service-level factors like frequency, availability, and convenience, formal BRT choice is driven by system-level factors like safety, dependability, and driver professionalism, according to comparative research on African BRT systems. This study confirms our conclusion that LAGBUS users place more emphasis on service availability, whereas BRT riders prioritise system features (Nkurunziza et al., 2012; Mwale et al., 2024).

Conclusion

The Bus Rapid Transit (BRT) and Lagos Bus (LAGBUS) systems in Lagos Metropolis were thoroughly investigated in this study, which provided fresh perspectives on user dynamics and performance. The results show that both systems, which primarily serve working-age, low-income commuters who rely heavily on public transportation, are essential to Lagos' urban mobility. Nonetheless, clear trends in their operational traits and patronage determinants surfaced. Although BRT has better system reliability, shorter wait times, and stronger safety perceptions, it has drawbacks like longer dwell times at stops and infrequent service, which lead to crowding and irregular travel schedules. On the other hand, LAGBUS provides more frequent service and more vehicles, but its passengers have to wait for much longer periods of time and are more susceptible to delays in operations. The demographics of the passengers also differ slightly: LAGBUS users are slightly older, more educated, and more likely to be married, whereas BRT riders are typically younger and less educated. Crucially, the study finds that while service-level factors like frequency, convenience, and

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vehicle capacity have a greater impact on LAGBUS, system-level factors like safety, dependability, and service identity are the primary drivers of BRT patronage. These results highlight the necessity of focused interventions to address each system's particular operational shortcomings while maintaining its advantages. Without strategic improvements, both schemes risk losing their competitive edge in a rapidly urbanising megacity where efficient and affordable public transport is critical to economic growth and social well-being.

Practical Implications

For policymakers, transportation planners, and operators in Lagos and other emerging megacities, the findings offer practical insights. First, especially for BRT, reducing lengthy waiting and dwelling times can greatly improve user satisfaction and boost ridership. Second, the different factors that influence patronage system reliability for BRT and service frequency for LAGBUS indicate that rather than using the same tactics for all schemes, service enhancements should be customised for each one. Third, the prevalence of low-income passengers emphasises how important it is to maintain service quality while keeping fares reasonable. Lastly, the entire urban mobility network can be strengthened by enhancing safety, incorporating digital payment systems, and guaranteeing smooth connections with other modes of transportation.

Recommendations

To improve operational efficiency and increase ridership, there is an urgent need to expand the bus fleets and optimise service schedules for both BRT and LAGBUS. Increasing the number of vehicles, particularly during peak periods, will help reduce waiting times and alleviate overcrowding, which are among the key deterrents to passenger satisfaction. Introducing more flexible and demand-responsive scheduling can further enhance reliability and ensure that services align with the city's evolving mobility patterns.

Operational management should also be strengthened through the adoption of real-time monitoring systems, transit signal priority, and faster boarding procedures to reduce dwell times. Integrating intelligent transport systems and automated ticketing will not only streamline operations but also provide accurate data for continuous service planning and performance evaluation. Safety and security must remain a top priority, with measures such as improved lighting at stations, increased presence of security personnel, regular vehicle maintenance, and consistent driver training to sustain passenger confidence in both schemes.

In addition, Lagos State should invest in infrastructure that supports seamless intermodal connections between BRT, LAGBUS, rail, ferry, and feeder bus services. A more integrated transport network will improve accessibility across the metropolis and make public transport a more attractive alternative to private vehicles. To maintain affordability for the predominantly low-income user base, government and private partners should consider targeted subsidies, flexible fare structures, or public-private partnerships to finance system upgrades without imposing excessive costs on commuters. Finally, ongoing collection of passenger feedback and operator data should guide evidence-based planning, ensuring that service improvements remain responsive to user needs and urban growth trends. These targeted measures, if implemented, will not only enhance the operational performance of BRT and LAGBUS but also contribute to a more sustainable, reliable, and inclusive urban transport system for Lagos.

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