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USERS' SATISFACTION WITH INTERCITY BUS TERMINAL QUALITY IN LAGOS STATE, NIGERIA

Summary. Globally, efficient intercity public transport relies on well-designed and high-quality terminal facilities and services to enhance accessibility, mobility, and safety for passengers and freight. Despite governmental efforts, bus terminals in Nigerian urban areas are becoming hotspots for unregulated activities and traffic chaos. In response, this study investigates users' satisfaction with Lagos State's intercity bus terminal quality, analysing socio-economic profiles, satisfaction levels with quality of terminal facilities (QoTF) and services (QoTS), and challenges impacting terminal operations. Using a cross-sectional survey, 200 questionnaires were distributed to terminal users, employing a multistage sampling technique. Descriptive (weighted mean analysis) and inferential (multiple linear regression [MLR] analysis) statistics were employed for data analysis. Results indicate that

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the majority of respondents are male, aged below 40, and permanent terminal users. Satisfaction is noted with 13 out of 24 parameters of QoTF, with top-ranking parameters including parking space, restaurant facilities, and waste disposal facilities. However, dissatisfaction is expressed with 8 out of 14 parameters of QoTS. Least-satisfied QoTS parameters include staff attitudes, passenger safety, and bus service reliability. Top-rated challenges affecting terminal operations are security concerns, sanitation facility deficiencies and insufficient passenger amenities. MLR analysis indicates a significant influence of terminal facilities on overall service satisfaction (F= 2.899, p= 0.000 <0.05). In conclusion, enhancing both terminal facilities and services is crucial for efficient operations in Lagos State's bus terminals. Recommendations include improving security measures, sanitary infrastructure and staff training to address user concerns and enhance satisfaction.

Keywords: bus terminal quality, transport infrastructure, transport planning, users' satisfaction, Lagos State, Nigeria

1. INTRODUCTION

The transport system continues to be a major driver of socio-economic and spatial interaction in cities. Among its critical components are intercity bus terminals, which serve several functions, including providing platforms for accessing transit services by prospective passengers in the city. Generally, terminal facilities such as airports, seaports, pipeline depots, road terminals, and terminus, public transport shields, rail terminals, and terminus, among others, are not only unique distinct fixed facilities but also ensure efficient transport operations and services by vehicles such as automobiles, bicycles, buses, trains, trucks, people, helicopters, and aircraft in society [30]. In this regard, Oyesiku [26] states that terminal facilities, in particular, and the transport system in general, directly raise socio-economic productivity and the overall development of society. Additionally, they facilitate proper allocation of resources and land use activities in line with competitive advantage and concomitant multiplier effects on the national economy, aside from their indirect productivity enhancement on environmental resources.

Broadly, terminal infrastructure in transport serves multiple purposes, including the interchange of passengers and cargo, vehicle maintenance, and providing leisure and amenity resources [20], alongside fulfilling important social, economic, and environmental functions within cities [6]. Accordingly, Oyesiku and Olaseni [25] characterized terminal infrastructure as a central hub for road transport activities, operated by both private and government entities, facilitating the transfer of people and goods for inter- and intra-city transport purposes. Essentially, a bus terminal or passenger terminal represents a shared public space within urban areas, distinguished by unique design, environmental characteristics, and the range of services offered to a diverse society within an enclosed or open environment. Consequently, the bus terminal assumes significance as a crucial public space in cities worldwide [3, 18], serving not only as a point of departure and arrival for bus routes [3] but also as a controlled space off the roads, facilitating various services [15, 16].

Despite the importance of bus terminals to the overall performance of the transport system and city development and sustainability, the bus terminals, particularly in developing nations, including Nigeria, are characterized by poor locational and distribution patterns. These affect not only passengers' accessibility and travel demand but also disorganize city arrangement,

function, aesthetics, and development. Consequently, poorly planned bus terminals promote chaotic traffic situations, create fear and fear of crime, unguided trading activities, and intractable parking systems in addition to unattractive patronage by operators and commuters [3, 30]. As a result, developing cities, especially in African countries, are constantly striving towards providing a raft of quality bus terminal infrastructure to meet the ever-increasing passenger, freight traffic demand and supply services. This supports their growth, development, and sustainability as well as minimizing their multidimensional problems. In other words, studies like Adebayo and Zubairu [2]; Litman [22], and Salisu [30] observed that for any city to attain the level of primacy, its economic stature and extensive regional interactions impose significant demands on its transport infrastructure, particularly on intercity bus terminals Oyesiku and Olaseni [25].

An ideal and quality bus terminal usually provides passenger holding areas, processing facilities including ticketing, dispatching point, and a bus express freight loading station with parking lots in a well-planned and organised manner [11]. A very good example of bus terminal facility includes Kifissos Bus Terminal in Greece, Toronto Bus Terminal in North America, and Chennai Mofussil Bus Terminus in India, which are of good environmental quality, effective operations, and responsive patronage from both the operators and other users [5,12, 14]. This is unlike what is in existence in Lagos State and other States within Nigeria. It is worth knowing that with rapid urban growth, high level of motorization, unguided population growth, and systematic withdrawal of the Nigeria government in the provision of quality transport infrastructural facilities, especially bus terminals, there are obvious threats and pressure not only on the transport system but also on the overall urban economies in Lagos State. In this context, Salisu [29, 30] opines that the Nigerian transport infrastructure related dilemma with the agglomeration of urban disorder and the unprecedented influx of people in public spaces has left the urban facilities including bus terminals and their associated services being overstressed. Beyond these, the basic terminal facilities required for its smooth running, such as well-design terminal structure, space, e-information and ticketing, safety and security, drainage, privacy, a restaurant, waiting room, toilet, and convenience are either missing or inadequate and less conducive to users' health living in Lagos State and other Nigeria States [30].

Emphatically, Lagos State, Nigeria's hub of commerce and industry [19], marked by a rapidly expanding population of 24 million in 2015 and growing at a rate of 3.2% annually, with an urbanisation rate of 16%, faces significant challenges related to transport system operations, including traffic congestion, unpredictable travel cost, insufficient mobility options, crime incidents and poor infrastructure management [30]. This shows how the extent of the overall transport system in Lagos is complex, chaotic, and intractable. Transport infrastructural facilities inadequacies with unregulated modal operational services are far-reaching, while these deficits have occasioned several quantitative and qualitative consequences both on users and city development at large [30, 31]. The planning and provision of bus terminal facilities in Lagos State and other Nigerian urban areas, in general, are not in line with the variation in the spatial characteristics and the residents' population agglomeration but rather in its traditional arrangement of locating terminals close to the market or at the city centre [29]. This deficiency no doubt contributes to and compounds the transport and traffic problems at the different sections of the State. Likewise, Ref. [9, 25] observed that the number of people victims of poor terminal facilities and operations including accessibility difficulty, safety, and security concerns [30] and service quality issues [31] greatly outnumbered those in traffic congestion in the State.

However, the increasing transport infrastructure facilities-related challenges which subsumed bus terminal facilities and operational service-related issues in the State have to be

accorded deserved attention. The terminal facilities are fast becoming hotspots for several activities, including unregulated trading activities and other inappropriate activities e.g., kidnapping, rape, rubbery etc., which may have an impact on facility resilience and users' satisfaction. Hence, the need to provide understanding on the satisfaction with the quality of transport infrastructural provision, with particular reference to intercity bus terminals that offer services to both captive and choice users. It is based on this backdrop that this study examined users' satisfaction with the quality of intercity bus terminals in Lagos, Nigeria. Achieving this aim, the following objectives were formulated: examined the socio-economic profile of the users of the bus terminals, assessed the level of satisfaction with the quality of the intercity bus terminals facilities (QoTF) and services (QoTS) as well as identified the challenges militating the quality of the bus terminals operations in Lagos State, Nigeria to improve terminal operations and enhance overall users' satisfaction.

2. CONCEPTUAL AND LITERATURE REVIEW

This subchapter is structured into two parts: conceptual review and literature review. The conceptual review elucidates relevant concepts that underpin the study, while the literature review delves into empirical research to identify gaps in the existing body of knowledge.

2.1. Conceptual review

The study is grounded in the concepts of intercity terminal location and quality, as well as users' satisfaction.

2.1. Concept of intercity terminal location and quality

The concept of intercity terminal location and quality encompasses both the importance of understanding the geographical positioning of terminals and the quality of facilities and services provided within them. Intercity terminals serve as pivotal points where line haul trips between cities originate and conclude, acting as interchange and transfer hubs for various modes of transport such as bicycle, motorcycle, foot mobile, taxi, private vehicle, minibus etc. and the location of the last or ultimate origin and destination points, as described by Bimal [10]. In other words, while the location of these terminals is critical, with considerations for accessibility, connectivity, and efficiency in facilitating travel between urban centres, the quality of facilities and services within intercity terminals significantly impacts their effectiveness [25, 28].

The importance of intercity terminal facilities for economic growth and development is enormous. However, the effectiveness of an intercity terminal facility is conditioned by its planned location, with the access or egress portion of the journey ideally being very short in distance. Additionally, the facility should be designed to accommodate users' parking, as most of the access trips are usually accomplished with private or personal means. It should also consider major roadside shelters for those stopping within urban settings before the line haul destination, as well as suburban stations for those alighting along the intercity trip line haul.

A well-located and functional intercity bus terminal facilitates ease of mobility, accessibility [9, 21], time and cost performance, patronage increase [21], improved trade activities, environmental quality enhancement, and reduction in urban stress [28, 32]. However, in situations where the access and egress portions within cities become significant in terms of

time, cost, and other socio-economic benefits, travellers may shift their choice to a mode of transport with more desirable performance characteristics [11]. Therefore, proper location and planning of intercity bus terminals will ultimately improve passengers' propensity to use them, thus enhancing socio-economic and environmental quality [5, 21].

Intercity terminal quality encompasses various aspects, including the physical infrastructure, such as terminal buildings, waiting areas, parking facilities, and amenities. It also involves the quality of services provided, such as ticketing processes, information dissemination, safety measures, and cleanliness. A well-designed and efficiently managed intercity terminal enhances mobility, accessibility, and overall user experience, contributing to increased patronage and economic activities. The concept of intercity terminal location and quality emphasizes the importance of both strategic positioning and the provision of high-quality facilities and services. By focusing on these dual aspects, transportation authorities can optimize the functionality and effectiveness of intercity terminals, ultimately improving the overall transportation experience and fostering socio-economic development.

2.1.2. Concept of users' satisfaction

In addition, the concept of users' satisfaction originates from the discrepancy theory proposed by Porter in 1961, as cited in Parker and Mathews [27]. It suggests that satisfaction arises when there is alignment between users' expectations and their actual experiences. Over time, this concept evolved into users' satisfaction, encompassing various user groups, and extending beyond traditional customer satisfaction metrics. The concept of users' or customer satisfaction is widely acknowledged across industries as a crucial aspect of assessing service quality and user experience [6, 9]. Users' satisfaction is influenced by a multitude of factors, including users' perceptions, experiences, and expectations. These expectations are shaped by past interactions, word-of-mouth recommendations, and information from marketers and competitors [24, 27]. Users evaluate the service they receive based on these expectations, leading to a perceived gap between desired and actual experiences. As such, users' satisfaction reflects the extent to which their needs, desires, claims, and aspirations are met in terms of service quality, reliability, convenience, and overall performance.

In transport studies, users' satisfaction serves as a vital metric for evaluating the quality of transportation services and infrastructure. Specifically, it provides understanding into passengers' perceptions and experiences with various transport facilities, such as intercity bus terminals. By assessing users' satisfaction levels, researchers, and policymakers can identify areas for improvement and implement measures to enhance service quality and user experience. Understanding users' satisfaction with terminal facilities helps optimize terminal design, layout, amenities, and services to better meet users' needs and preferences [21].

In the assessment of intercity bus terminal quality, users' satisfaction is instrumental in achieving study objectives. By evaluating users' satisfaction levels with terminal facilities, researchers can gauge the effectiveness of existing infrastructure and services in meeting user expectations and needs [27]. This information is crucial for identifying gaps, challenges, and areas for improvement in intercity bus terminal operations and management. Prioritizing users' satisfaction in planning and decision-making processes contributes to the development of more user-centric and efficient transport systems, enhancing overall service delivery and urban liveability. Hence, it should be a priority in planning public facilities:

2.2. Literature review

The terminal constitutes a critical link in the overall commuting and trading chain [3, 17], and to a large extent, their level of efficiency and performance determines a city's competitiveness [4]. Essentially, the higher efficiency of inter and intra city terminal may result in lower costs for the economy, and it may not be so if otherwise [2, 7]. A terminal serves more than just a location where bus routes begin or end, and where vehicles stop, turn, or wait before departing on their return journeys [13]. It also fulfils numerous direct and indirect functions, beyond its primary role as a transport hub, acting as the central hub of economic activities in the areas it serves [8, 13].

The high concentrations of human populations, social, economic, and other activities in urban areas necessitate the high proportion of transport infrastructural facilities. These facilities address not only the increasing mobility demands but also facilitate ease of accessibility and actualization of basic human needs and other related desires. That is the provision of transport infrastructural facilities as being crucial to not only economic development but also the socio-cultural and political life of a nation, including developing and developed. Badejo [8] observed that transport is a vital component in every aspect of a nation's development, as it is consistently required for the collection, assembly, transfer, and distribution of people, goods, and various resources. Ref. [5] noted that well-planned transport infrastructure is essential for city growth.

Likewise, Ref. [26] observed that the availability of transport infrastructural facilities promotes various activities which produce economic development and increasing economies of scale of which trade demands activities improves and expand, while Ref. [22] and [23] noted that transport infrastructure facilities have discernible and significant effects, spanning from direct physical impacts on the natural environment to more indirect social and economic effects on neighbouring communities. In this regard, Ref. [25] noted that the intercity passenger terminals contributed to the socio-economic development of Lagos despite their poor physical appearance. However, it is noted in the literature that a well-planning and improved quality of bus terminal are required for quality mobility functions, socio-economic development and environmental quality [9, 32], suggesting the need for continuous assessment for improvement.

Ref. [2] conducted a study on user satisfaction with motor park facilities in Minna, focusing on waiting areas, conveniences, and refreshment areas. The findings indicated that a significant proportion of motor park users were dissatisfied with the facilities, with many parks being in a state of disrepair and requiring maintenance. Similarly, Ref. [7] evaluated the quality of intra-urban bus services provided by both government agencies and private operators in Enugu. The study revealed variations in passengers' waiting time, walking distance to bus stops, and bus service frequency across different parts of the city, indicating disparities in service levels. Additionally, Ref. [25] investigated the relationship between the distribution of intercity road passenger terminals and the transportation needs of various socio-economic groups. Their findings demonstrated clustering in terminal distribution and significant variations in operational characteristics across different activity zones. The study concluded that understanding the patterns and factors influencing terminal location and patronage is crucial for addressing the transport requires of diverse socio-economic groups within the city. However, most of the previous studies failed to consider the intra-city bus terminal and quality as well as users' satisfaction in Nigerian urban areas.

3. STUDY AREA AND METHODOLOGY

3.1. Study area

This research was conducted within the borders of Lagos State, Nigeria [Fig. 1], which is no doubt the country's economic and commercial hub with endless opportunities attracting the huge influx of people to the state and generating high and complex travel demands [19]. According to Ref. [19], Lagos State, which has 20 Local Government Areas, 3577 km square of land area and is located on 3o45'E and 6o35'N of Longitude and Latitude respectively, is the former capital territory and most populated state in Nigeria (Fig. 1). It is interesting to note that among the 36 states in Nigeria, this particular state boasts the most advanced and functional transportation system, encompassing various modes such as road, rail, water (both inland and maritime), air, pipeline, and cable transport, with ongoing construction projects aimed at further enhancing its infrastructure. The state has 17 government approved intercity bus terminals, offering services to both choice and captive riders' request to different part of Nigeria [16].
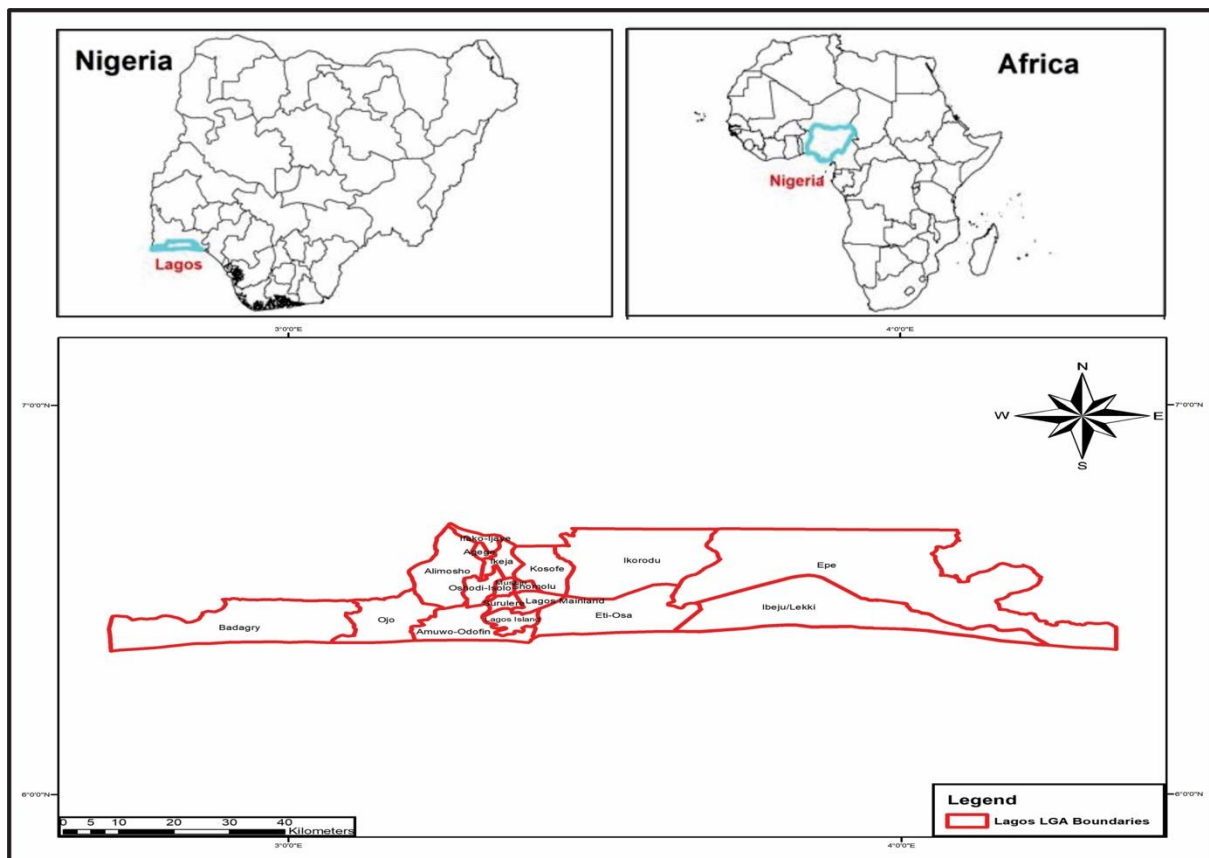
Fig. 1. Lagos State in the Context of Nigeria and Africa

3.2. Methodology

Significantly, this study utilized a cross-sectional survey research design along with quantitative data collection methods. A cross-sectional survey is found appropriate to use when the research is aimed at gathering information from a sample in a given population within a specific time frame and examining the interaction between variables in a descriptive nature [1].

Data for this study was gathered from primary and secondary sources. The primary data primarily consisted of a questionnaire distributed to bus terminal users, which was supplemented by field observations. Secondary data include the relevant topic issues extracted from related books, journal articles and unpublished materials.

The study population comprised of users which include terminal staff, drivers and passengers of the intercity bus terminal found across the state. In other words, the multistage sampling technique was adopted to obtain the perception data, used to answer the research objectives. The first stage entailed the stratification of the terminals in the study area into two strata (intra and intercity) based on the approved list of bus terminals in the state and four (4) out of seventeen (17) namely Oshodi, Ketu, Iyana-Ipaja and Ojuelegba intercity bus terminals were selected randomly from the stratified intercity bus terminal list [19]. The second stage involved the use of convenience sampling method to allot 50 copies of the questionnaire to each of the selected intercity bus terminals, amounting to 200 distributed copies in the study area.

The third and the last stage involved the use of a systematic sampling technique to pick every third terminal users found seated and waiting at the bus terminal seating areas or duty post, after the first respondents have been randomly selected across the selected locations. Worthwhile, the first respondent found at proximity to the shed entry gate was selected, while subsequent respondents were selected at every fourth interval until the 50 copies were exhausted at each terminal. Nonetheless, out of the 200 administered copies of the questionnaire, 144 equivalent to 72 per cent was fully completed and used for analysis in a proportion of 43, 39, 32, and 30 across Oshodi, Ketu, Iyana-Ipaja and Ojuelegba bus terminals respectively.

However, data collected were analysed using descriptive (percentage frequency distribution table and weighted mean analysis) and inferential (multiple linear regression -MLR analysis) statistics. A percentage frequency distribution table was used summarizes data by displaying the proportion of occurrences for each category or value, expressed as a percentage of the total and the weighted mean analysis corroborated the percentage frequency distribution table analysis, thus calculates an average by considering the relative importance of each observation through assigned weights. Likert's scale measured based on 4-point with the assigned weight distribution as very satisfied = 4, satisfied = 3, not satisfied = 2 and not at all satisfied = 1, was used to obtain the weighted mean value and achieved the descriptive analysis. While MLR analysis which was used to test the hypothetical statement, measured on a dichotomous scale (dummy variable) to the established association between a binary outcome variable (overall satisfaction with quality of terminal services [O-QoTS]) and a set of predictor variables (satisfaction with the quality of terminal facilities [QoTF]) (see Tab. 1). Thus, the MLR model is depicted by the subsequent equation:

$$Y= a+ b_1X_1 + b_2X_2 + \ldots\ldots b_nX_n + \varepsilon \tag{1}$$

Where:
Y= Dependent variable (overall satisfaction with quality of terminal services O-QoTS);
a= Slope/Intercept; b1-bn= Regression coefficients;
X_1-X_n = Independent variables (satisfaction with quality of terminal facilities QoTF).
and ε = Error term.

To conduct the inferential statistical analysis, we converted the collected data into a dichotomous form using binary digits 0 and 1. Specifically, "Strongly Satisfied" and "Satisfied" were coded as 1, while "Strongly Dissatisfied" and "Dissatisfied" were coded as 0 (Tab. 1). This transformation applied to the parameters of the quality of bus terminal facilities (QoTF),

which served as the independent variables, and the indices of overall satisfaction with quality of terminal services (O-QoTS), acting as the dependent variable. The transformed dependent and independent variables were then regressed against one another to test the postulated hypothesis. The analysis and presentation of the data were performed using version 21 of the Statistical Package for Social Sciences (SPSS) software.

4. RESULTS AND DISCUSSION

4.1. Socio-economic profile of users

The socio-economic characteristics of respondents play a crucial role in understanding their attitudes, knowledge, and perceptions, especially regarding bus terminal facilities in Lagos State. To grasp the perceived quality, satisfaction rate, and service level of intercity bus terminals, we examined various socio-economic variables such as status/position, gender, age, occupation, monthly income, educational status, vehicle ownership, average trip cost to the bus terminal, and average trip distance to the bus terminal. Tab. 1. presents the findings from the analysis of socio-economic characteristics data collected. Initially, an investigation was conducted to understand the profile of terminal users and the status of the sampled respondents. The results indicated that a significant majority (75%) of respondents were regular users of the bus terminals, while less than a quarter (25%) were transit users. Most of the sampled respondents by implications consists of permanent users which include regular passengers, staff, drivers, and business owners engaged in trading activities within the intercity bus terminals. This finding corroborates the studies of [5, 32] conducted in a different context.

Regarding gender classification, the study revealed that terminal users were almost evenly distributed between males (53%) and females (47%). This marginal difference is attributed to the necessity of transportation for both genders. Additionally, the age classification of respondents showed that about 40% were below 30 years old, with the 30-39 age group following closely. Respondents aged 40-49 years constituted the smallest age group using the intercity bus terminal. In terms of educational status, approximately 65% of respondents had formal education, while 35% had no formal education. This suggests that most respondents were capable of understanding and responding adequately to the study questions. Regarding occupational status, the study indicated that 35% of respondents were self-employed, followed by civil servants (22%) and trade unionist (20%). Notably, food vendors comprised less than 7% of the sampled, indicating minimal usage of the intercity bus terminals among these groups. Findings supports the study of [21] that bus terminal architecture accommodates different users.

In terms of average monthly income, 57% of participants reported earning less than ₦30,000 per month, consistent with their occupational status. Meanwhile, respondents with the least monthly income earned above ₦120,000 monthly, indicating that the majority of bus terminal users earn below the national minimum wage, suggesting a high level of captive users. Trip distance emerged as another important socio-demographic attribute, revealing the distance between the intercity bus terminal and the place of trip generation or usual homes. The majority (40%) of respondents travelled less than 5 km to access the intercity bus terminal, while 32% travelled close to 15 km. Additionally, 9% of respondents travelled between 11 km and 15 km to the bus terminal. Notably, the most common trip distance was less than 5 km. Findings on the cost of travel varied significantly across users but correlated with the distance covered, as respondents who spent below ₦500 dominated, while those who spent above ₦1500 accounted for the least. This suggests that longer distances covered result in higher travel costs,

underscoring the need for expanding intercity bus terminal provision in the study area. Understanding the socio-economic profile of the users emphasised the need for tailored strategies in intercity bus terminal planning and management to accommodate various demographic groups and address their specific needs and challenges.

Tab. 1

Socio-economic status of the users

Respondents Status	Variables	Frequency	% population
Status of the terminal users	Permanent user	110	76.4
	Transit user	34	23.6
	Total	144	100.0
Gender	Make	76	52.8
	Female	68	47.2
	Total	144	100.0
Occupational type	Civil and public service	31	21.5
	Self-employed	51	35.4
	Trade union workers	29	20.1
	Food vendor	10	6.9
	Students and unemployed	23	16.0
	Total	144	100.0
Age Classification	Below 30 years	53	36.8
	Between 30 and 39 years	42	29.2
	Between 40 and 49 years	23	16.0
	50 years and above	26	18.1
	Total	144	100.0
Level of Education	No formal education	52	36.1
	Primary or secondary	30	20.8
	National diploma/ higher national diploma	23	16.0
	B.Sc./postgraduate	39	27.1
	Total	144	100.0
Average Monthly Income	Less than ₦30,000	82	56.9
	₦30,000 - ₦90,000	22	15.3
	₦90,001 - ₦120,000	330	20.8
	Above ₦120,000	10	6.9
	Total	144	100.0
Average distance travel from home to terminal	Less than 5km	57	39.6
	5km-10km	28	19.4
	11km-15km	13	9.0
	Above 15km	46	31.9
	Total	144	100.0
Trip cost from home to terminal	Below ₦500	56	38.9
	Between ₦500-₦1000	25	17.4
	Between ₦1001-₦1500	21	14.6
	Above ₦1500	42	29.2
	Total	144	100.0

4.2. User's satisfaction with the quality of bus terminal facilities (QoTF)

Intercity bus terminals serve as central handling and exchange points for passengers and goods, enhancing smooth public accessibility and traffic flow, thus improving spatial interactions and serving as utility landmarks for social and commercial economic activities. Given these unique characteristics, their quality, particularly in terms of facilities and services, must not be compromised. To determine the quality of intercity bus terminals within the study area, users' satisfaction with bus terminal facilities in terms of design, structural capacity, and appearance of the terminals in Lagos State, under three dimensions of economic, social and environmental facilities, were studied and presented in Tab. 2. The analysis was carried out using mean weighted analysis that relies on the sum of weighted value (SWV) and relative weighted value (RWV) value based on a four-point Likert scale, ranging from 1 (least satisfied) to 4 (very satisfied). The SWV was calculated by summing the products of the total number of responses to each variable and its corresponding weight value, while the weighted mean index value (MIV) was obtained by dividing the relative weighted value (RWV) by the total number of variables.

Tab. 2. presents the results, showing the users' satisfaction with the quality of intercity bus terminal facilities (QoTF) in relation to the economic, social, and environmental facilities of the bus terminal using the Quality of Terminal Facility Index (QoTFI) (see Tab. 2). The analysis yielded a total RWV of 70.51 and a MIV or QoTFI of 2.938 (Tab. 2). Most respondents expressed the highest satisfaction with parking space for buses and private vehicles (M=3.319), restaurant facilities and conditions (M=3.194), and solid waste collection and disposal facilities (M=3.132). Ref. [21] observed that for bus terminal architecture to offer viable business process improvement and customer satisfaction, the integration of sufficient parking space, restaurant facilities, sanitary and medical facilities and information technology system must be prioritised. Other aspects that garnered high satisfaction ratings included the physical appearance and cleanliness of the terminal (M=3.0760, ease of terminal accessibility facilities (M=3.049), availability and condition of toilet facilities (M=3.035), water supply and condition of facility (M=3.035), walking pavement design (M=3.021), terminal size and space (M=2.993), electricity/power supply (M=2.979), road conditions (M=2.972), mechanical maintenance and vulcanizing facilities (M=2.944), and quality of building materials (M=2.938). These facilities were ranked first through thirteenth among the twenty-four observed terminal facilities, while the other observed facilities were ranked below the Mean Weighted Value of 2.938, as identified in Tab. 2. Provision of terminals with quality and green facilities enhanced operations [22, 32].

Furthermore, out of the thirteen (13) rated terminal facilities ranked above the Mean Weighted Value, six (6) factors, equivalent to 46%, accounted for economic-related facilities, two (2) terminal facilities, equivalent to 15%, were social-related facilities, while five (5) terminal facilities, equivalent to 39%, were environmental-related facilities. Worthwhile, out of the total observed bus terminal facilities used in measuring users' satisfaction with the quality of intercity bus terminals, the majority (54%) of the terminal facilities rated and ranked above the mean weighted value (MWV), while 46% of the facilities ranked below the Mean Weighted Value, indicating that the respondents are less satisfied with the other eleven (11) facilities ranked below the MWV. Meanwhile, parking space facilities for buses and other private users (3.319) accounted for the most ranked users' most satisfied terminal facility, while the facility of passenger waiting (2.632) was ranked the least satisfied terminal facility. The studies of Ref. [30-32] observed that the provision of transport infrastructure including bus terminals are mostly designed as enterprise architecture thus focusing more on the provision of economic

facilities than social and environmental facilities as reported in this study, which hinders the satisfaction level of users.

However, it can be deduced from this analysis that there is an obvious variation in the satisfaction level with the quality of intercity bus terminal facilities (QoTF) across the economic, social and environmental facility dimensions, as findings emphasized the most significance of economic facilities in intercity bus terminals satisfaction assessment than that of social and environmental facilities. It also highlights areas for improvement, as close to half of the observed facilities fell below the QoTFI, indicating dissatisfaction, suggesting the need for targeted improvements to enhance overall user satisfaction and optimize the quality of intercity bus terminals. Ref. [31, 32] suggests comprehensive transport infrastructure planning with systematic evaluation of users' metric reports enhances quality facility provision, which in turn promotes both users' satisfaction and the enterprise architecture.

Tab. 2

User's satisfaction with the quality of bus terminal facilities (QoTF)

Indices	Very Satisfied	Satisfied	Not Satisfied	Not At all Satisfied	SWV	RWV	Rank
Economic							
Ease of terminal accessibility	34	83	27	0	439	3.049	5
Walking pavement with shield	47	60	30	7	435	3.021	8
Size and space of the terminal	36	71	37	0	431	2.993	9
Road condition	43	54	47	0	428	2.972	11
Facility for mechanical and vulcanising spaces	46	44	54	0	424	2.944	12
Quality of building materials	26	90	21	7	423	2.938	13
The proximity of the resident location to the terminal (Kilometres)	34	54	46	10	400	2.778	20
Cost of accessibility to terminal	30	53	54	7	394	2.736	21

Social							
Physical appearance and cleanness of terminal	44	74	19	7	443	3.076	4
Toilet facility availability and condition	46	64	27	7	437	3.035	6
Facility for security matters (office and personnel)	33	66	45	0	420	2.917	14
Number of offices with electrical fixtures	33	72	32	7	419	2.91	15
Terminal setbacks from the main road	30	70	37	7	411	2.854	17
Facility for route information/communication	20	87	31	6	409	2.84	18
The extent of social relationships among terminal workers	41	59	24	20	409	2.84	18
Facility for medical health matters (first aid treatment room with medical personnel)	34	47	50	13	390	2.708	22
Environmental							
Parking space facility for buses and private vehicles	66	58	20	0	478	3.319	1
Restaurant facility and condition	73	30	37	4	460	3.194	2
Facility for solid waste collection and disposal	48	67	29	0	451	3.132	3
Water supply facility and condition	54	41	49	0	437	3.035	6

Electricity /power supply facility	37	74	26	7	429	2.979	10
Drainage facility and condition	33	74	26	11	417	2.896	16
Facility for air and noise control measures	14	81	42	7	390	2.708	22
The facility of passenger waiting and condition	33	51	34	26	379	2.632	24
QoTFI						70.51 /24 = 2.938	

4.3. Users' satisfaction with the quality of bus terminal services (QoTS)

Users' satisfaction with the quality of intercity bus terminal services (QoTS) was examined using the Quality of Terminal Services Index (QoTSI), and the results were presented in Tab. 3. through the percentage frequency distribution analysis and Mean Weighted Analysis, which relied on a score of 30.19 and 2.157 as the Relative Weighted Value (RWV) and Mean Index Value (MIV) or QoTSI. Quality assessment of transport infrastructure including bus terminals, based on users' centric metric not only enhances sustainable development initiatives [26, 27, 30] but also affects users' behaviour [12, 14], ultimately shaping urban mobility and environmental sustainability [30]. In response to this and based on the findings presented in Tab. 3, it is evident from the frequency distribution analysis that the majority of respondents expressed a high level of dissatisfaction with most parameters included in the QoTS metric assessment, as the percentage of perceived dissatisfaction rated above 50% for all parameters, indicating a significant rating below satisfaction (Tab. 3). Supporting the findings, another descriptive metric analysis conducted using the Mean Weighted Analysis relying on RWV and MWV or QoTSI for QoTS revealed that the majority (8) out of 14 service quality attributes (QoTS) rated below the QoTSI, indicating most parameters are less satisfactory QoTS, while the remaining 6 accounted for 43%, indicating the most satisfactory QoTS. The six most satisfactory QoTS attributes are turnaround time of vehicles within the terminal (M=3.403), height of passenger and vehicle interchange at the terminal (M=3.271), number and condition of buses (M=3.257), waiting time of passengers within the terminal (M=3.194), parking services within the terminal (M=3.188), and fare collection and payment methods (M=3.104), ranking first (1st) to sixth (6th) respectively among the observed fourteen (14) quality of bus terminal services (QoTS). Longer and unpredictable turnaround time of vehicles within the terminal and the extended waiting time of passengers significantly impede terminal operations [14, 32], leading to decreased efficiency [12, 30] and potentially reduced users' satisfaction.

Furthermore, it is worth noting that the eight parameters that ranked below the QoTSI, indicating the less satisfied bus terminal services, are luggage handling and delivery (M=3.076), terminal workers are well-dressed and neat, thus no odour that suffocates the passengers (M=3.069), height of information within the terminals (M=3.069), condition of line-haul stop (M=3.000), bus maintenance workshop and services (M=2.979), frequency and reliability of bus service within the terminal (M=2.979), attitudes and empathy of terminal workers and

drivers (M=2.938), and safety of passengers and freight (M=2.938). In other words, it is evident from these findings that the safety and security of passengers and freight, the attitudes and empathy of terminal workers and drivers, and the frequency and reliability of bus service within the terminal (1.813) were the least satisfied QoTS attributes. Supporting the finding, Ref. [24, 32] observed that compromised security and safety of passengers and freights at transport terminals jeopardises terminal operations, passenger confidence in using the facility and poses significant risks to environmental safety and public well-being [3, 30]. Meanwhile, Ref. [14, 21] observed that the attitude, action, and behaviour of terminal workers and drivers impact the efficiency of terminal operations, service quality and overall service delivery. Therefore, based on the findings presented in Tab 3, it can be deduced from this analysis that there is a clear variation in the level of users' satisfaction with the quality of bus terminal services, and to enhance the satisfaction level, there is a need to improve the least satisfied parameters presented in Tab. 3, with much priority on security and safety measures within and around the terminal as well as the attitudes and empathy of the workers and drivers for better service delivery quality, productive terminal operation and overall users' satisfaction with terminal services.

Tab. 3

User's satisfaction with the quality of bus terminal service (QoTS)

Indices	Very Satisfied	Satisfied	Not Satisfied	Not At all Satisfied	SWV	RWV	Rank
Turnaround time of vehicle within the terminal	28	162	146	10	490	3.403	1
Height of passenger and vehicle interchange	32	129	146	20	471	3.271	2
Number & condition of buses	8	204	78	35	469	3.257	3
Waiting time of passengers within the terminal	16	132	144	24	460	3.194	4
Parking services within the terminal	20	150	112	33	459	3.188	5
Fare collection and payment methods	48	72	150	33	447	3.104	6
Luggage handling and delivery	16	78	182	23	443	3.076	7

Terminal workers are well-dressed	16	108	140	34	442	3.069	8
Height of information within the terminals	16	96	156	30	442	3.069	9
Condition of line-haul stop	24	78	148	38	432	3.000	10
Bus maintenance workshop and services	16	69	166	34	429	2.979	11
Frequency and reliability of bus service within terminal	0	72	174	33	423	2.938	12
Attitudes and empathy of terminal workers and drivers	16	36	154	51	401	2.785	13
Safety of passengers and freight	24	39	128	61	396	2.75	14
QoSI						43.08/14 = 3.077	

4.3.1. Overall users' satisfaction with quality of bus terminal services (O-QoTS)

Further examination was carried out regarding the respondents' overall satisfaction level with the quality of intercity bus terminal services (O-QoTS), specifically focusing on the services that facilitate ease of transiting both passengers (captive and choice users, able and disadvantaged groups etc.) and freights (light and heavy goods) to another vehicle and mobility services within terminal and on-transit to destination, with the results presented in Tab. 4. The analysis indicated that the majority (59%) of respondents sampled expressed dissatisfaction with the overall quality of intercity bus terminal services (O-QoTS), while slightly over one-tenth (12%) were very satisfied, nearly one-quarter (18.8%) were fairly satisfied, and almost one-tenth (10%) were not satisfied at all with the overall quality of intercity bus terminal services. These findings suggest that the proportion of respondents dissatisfied with the overall quality of intercity bus terminal services (O-QoTS) exceeded those satisfied with it in the study area (Tab. 4.). In agreement with Ref. [21], the services quality satisfaction reflect a good enterprise architecture of the terminal facility and operations within the facility, which promote business sustainability without compromising customers' needs, expectations, and satisfaction.

Tab. 4

Overall users' satisfaction with the quality of bus terminal services (O-QoTS)

Nature of satisfaction	Frequency	Percentage
Very satisfied	17	11.8
Fairly satisfied	27	18.8
Not satisfied	86	59.7
Not at all satisfied	14	9.7
Total	144	100.0

4.3.2. Hypothesis testing: users' satisfaction with quality of terminal facilities (QoTF)does not influence overall satisfaction with quality of terminal services (O-QoTS)

To statistically determine whether or not users' satisfaction with the quality of terminal facilities (economic, social, and environmental terminal facilities) influences overall satisfaction with the quality of terminal services, further investigation was conducted using a multiple linear regression (MLR) analysis. In this agreement, Ref. [3, 5, 9 14] that empirical inquiries into spatial phenomenon give evidence-based findings that are scientific enough to inform decision-making for both policy formulation and practice. In response to this, this investigation through the MLR analytical method utilizes dummy variables within the regression model to convert or transform the qualitative variables into quantitative variables in a dichotomous format. It aimed to establish a relationship between a binary outcome variable (overall users' satisfaction with the quality of terminal services- O-QoTS) and a set of predictor variables (satisfaction with quality of terminal facilities- QoTF). The dependent and independent variables were assessed using perceived questions, which were reclassified into binary values as Fairly Satisfied/Very Satisfied (1) and Not Satisfied/Not at all Satisfied (0) (Tab. 5). Employing a MLR model with binary variables extends the regression model's capability to analyse qualitative variables measured on a nominal binary digit coded item scale and determine the impact of two or more independent variables on a dependent variable [1].

Tab. 5

Operational definition of variables of QoTF and O-QoTS

Variable (data source) description	Variable operational definition
Dependent variable	
Overall users' satisfaction with quality terminal services (O-QoTS)	Dichotomous (dummy): 0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Independent Variables	
Satisfaction with quality of terminal facilities (QoTF)	Dichotomous (dummy):
Economic Facilities	
The structural arrangement of terminal facilities	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Ease of terminal accessibility	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Facility for mechanical and vulcanizing spaces	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied

Size and space of the terminal	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Road condition	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
The proximity of the resident location to the terminal	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Walking pavement with a shield design	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Quality of building materials	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Cost of accessibility to terminal	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Social Facilities	
Physical appearance and cleanness of terminal	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Toilet facility availability and condition	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Terminal setbacks from the main road	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Facility for security matters within the terminal	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Facility for route information/communication	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Number of offices with electrical fixtures	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Facility for medical health matters (first aid treatment room with medical personnel)	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Social relation among terminal workers	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Environmental Facilities	
Facility for solid waste collection and disposal	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Facility for air and noise control measures	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Water supply facility and condition	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Drainage facility and condition	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Parking space facility	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
The facility of passenger waiting and condition	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Restaurant facility and condition	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied
Electricity /power supply facility	0 = Not Satisfied/Not all Satisfied, 1= Satisfied/Very Satisfied

Tab. 6. presents a summary of the multiple regression model. The result of the F-ratio of ANOVA in the multiple regression model indicates a value of 2.899, with an observed significant value of 0.000 (Tab. 6). Upon comparison of the observed significant value with the table level of significance, it is evident that the observed significant value (p=0.000) is lower than the table significant value (0.05). Consequently, we accept the alternative hypothesis (H$_1$) and reject the null hypothesis (H$_0$). This suggests a relationship between users' satisfaction with the quality of terminal facilities (including economic, social, and environmental terminal facilities) and overall users' satisfaction with the quality of intercity bus terminal services in the study area. Therefore, this significant relationship between the dependent and independent variables is not due to chance. Furthermore, the model's Adjusted R square results demonstrate a 48% explained variation. This indicates that the predictors (independent variables) were able to predict and explain approximately 50% of the variation in the dependent variable, the overall level of satisfaction. By implication, this study established through these findings that the improvements in terminal facilities significantly enhance the overall satisfaction levels of service quality among users of the bus terminal. The remaining unexplained variation may be attributed to the inherent nature of the data utilized in the analysis.

Findings also revealed eleven (11) predictors (independent variables) out of the twenty-five (25) predictors best predict the model, out of which five (5) are economic facilities, four (4) are social facilities and two (2) were environmental. That is, the structural arrangement of terminal facilities (sig. p=.000), ease of terminal accessibility (sig. p=.018), size and space of the terminal (sig. p= .031); walking pavement with shield (sig. p=.035); cost of accessibility to the terminal (sig. p=.042); facility for security matters within the terminal (sig. p=.027), terminal setbacks from the main road (sig. p=.009); facility for route information/communication (sig. p=.030), social relation among terminal workers (sig. p=.022); parking space facility (sig. p=.035) and facility of passenger waiting and condition (sig. p=.044) significantly determine and predict the overall users' satisfaction with the quality of intercity bus terminal services (dependent variable). In other words, these findings from reveal a significant relationship between the quality of bus terminal facilities and users' overall satisfaction with the service quality. This emphasised the significance of enhancing economic, social, and environmental facilities within the terminals to boost user satisfaction. Moreover, the identification of eleven key predictors among the variables highlights specific areas for improvement, emphasizing the pivotal role of these factors in shaping users' overall satisfaction levels.

Tab. 6

Multiple regression result of the relationship between users' satisfaction with the quality of terminal facilities and overall satisfaction with the quality of bus terminal services

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.617[a]	.481	.349	.412

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	12.300	25	.492	2.899	.000[b]
	Residual	20.026	118	.170		
	Total	32.326	143			

a.   Dependent Variable: Overall satisfaction with the quality of terminal services

Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.160	.199		5.820	.000
The structural arrangement of terminal facilities	-.585	.094	-.524	-6.202	.000
Ease of terminal accessibility	.110	.083	.108	1.327	.018
Facility for mechanical and vulcanizing spaces	.095	.091	.101	1.051	.295
Size and space of the terminal	-.023	.093	-.025	-.252	.031
Road condition	.079	.105	.081	.757	.451
The proximity of the resident location to the terminal	-.021	.091	-.021	-.230	.818
Walking pavement with a shield design	-.092	.095	-.092	-.967	.035
Quality of building materials	-.016	.089	-.016	-.178	.859
Cost of accessibility to terminal	-.019	.093	-.019	-.200	.042
Physical appearance and cleanness of terminal	.107	.090	.101	1.181	.240
Toilet facility availability and condition	-.003	.098	-.003	-.027	.979
Terminal setbacks from the main road	.037	.090	.037	.414	.009
Facility for security matters within the terminal	.054	.096	.054	.563	.027
Facility for route information/communication	-.101	.097	-.103	-1.039	.030
Number of offices with electrical fixtures	.074	.085	.078	.865	.389
Facility for medical health matters (first aid treatment room with personnel)	-.078	.093	-.080	-.842	.402
Social relation among terminal workers	.172	.095	.177	1.816	.022
Facility for solid waste collection and disposal	-.023	.101	-.023	-.227	.821
Facility for air and noise control	.099	.091	.101	1.093	.276
Water supply facility and condition	-.003	.089	-.003	-.038	.970
Drainage facility and conditioN	-.037	.087	-.038	-.421	.675
Parking space facility	-.031	.090	-.030	-.339	.035
Facility of passenger waiting and condition	-.067	.088	-.069	-.765	.044
Restaurant facility and condition	.069	.088	.067	.776	.439
Electricity /power supply facility	-.022	.083	-.022	-.260	.795

a. Dependent Variable: Overall satisfaction with the quality of terminal services

4.4. Challenges affecting the quality of the bus terminal operation

The examination of challenges impacting the quality of bus terminals operations was conducted, and the results of the analysis are presented in Tab. 7. Relying on the findings from

the perception of the users of the sampled intercity bus terminals revealed that the majority of respondents strongly agree with all identified problems across all terminals (Tab. 7.). Specifically, respondents expressed strong agreement regarding insecurity and crime activities such as theft, public assault, and kidnapping (82%), inadequate sanitation facilities and poor condition (75.1%), inadequate facilities for passenger seating, information, and assistance (86.8%), air pollution from vehicle emissions (77.8%), high level of informal activities such as street vending and hawking (70.8%), touts' activities and union violence (78.5%), environmental hazards such as poor drainage condition and odour from drains (70.1%), limited integration with cycling and pedestrian facilities (68.8%), congestion with terminal and poor terminal maintenance (72.2%), poor parking space and arrangement and lighting (75.7%), noise and water pollution (70.8%), and irregular bus scheduling and waiting time (61.1%) as major problems confronting the sampled intercity bus terminals in Lagos State.

Additionally, upon careful observation of the results, it is noted that the percentage of respondents who disagreed with the observed issues was less than 40% across the board. This implies that most sampled respondents agreed that these problems significantly hinder the achievement of quality intercity bus terminals operations in the study area. Notably, the analysis indicates that inadequate facilities for passenger seating, information, and assistance (86.8%) and insecurity and crime activities (82%) are the most frequently cited challenges, while irregular bus scheduling and waiting time (61.1%) is perceived the least problematic among all challenges.

Another dimension of the analysis using the mean weighted analysis which rely on the relative weighted value (RWV) of 35.924 and the mean index value (MIV) or the challenges mitigating quality of bus terminal operation index (CMQBTOI) of 2.994 revealed that 6 out 12 factor challenges, equivalent to 50% rated above the CMQBTOI of 2.994, indicating most-significant challenges affecting the quality of bus terminal operations in Lagos State, Nigeria, while the remaining 6 factor challenges rated below the CMQBTOI, indicating less significant factor challenges affecting quality of bus terminal operation in the study area (Tab. 7.). The top-rated challenges are insecurity and crime activities such as theft, public assault, and kidnapping (M=3.222), inadequate sanitation facilities and poor condition (M=3.146), inadequate facilities for passenger seating, information, and assistance (M= 3.111).

In other words, the thorough examination of problems associated with the selected bus terminals reveals widespread agreement among respondents, as highlighted in Tab. 7. The findings emphasis the significant impact of various issues such as air and noise pollution, sanitation challenges, insecurity, and inadequate infrastructure on the quality of intercity bus terminal operations in the study area. Particularly noteworthy is the prevalence of concerns related to insecurity, with 86.8% of respondents expressing agreement. These findings emphasize the urgent need for comprehensive interventions to address these challenges and improve the overall quality of intercity bus terminals operations in Lagos State, and other Nigerian urban areas with similar transport infrastructure challenges.

Tab. 7

Challenges mitigating the quality of the selected bus terminal in the study area

Indices	Strongly Agree	Agree	Disagree	Strongly Disagree	Total	SWV	RWV	Rank
Insecurity and crime activities	58	60	26	0	144	464	3.222	1

Inadequate sanitation facilities and poor condition	61	47	32	4	144	453	3.146	2
Inadequate facilities for passenger seating, information and assistance	35	90	19	0	144	448	3.111	3
Air pollution from vehicle emissions	59	53	19	13	144	446	3.097	4
High level of informal activities such as street vending and hawking	50	52	42	0	144	440	3.056	5
Touts activities and union violence	34	79	31	0	144	435	3.021	6
Environmental hazards	48	53	33	10	144	427	2.965	7
Limited integration with cycling and pedestrian facilities	40	59	39	6	144	421	2.924	8
Congestion with terminal and poor terminal maintenance	38	66	29	11	144	419	2.910	9
Poor parking space and arrangement and lighting	22	87	28	7	144	412	2.861	10
Noise and water pollution	30	72	29	13	144	407	2.826	11
Irregular bus scheduling and waiting time	37	51	44	12	144	401	2.785	12
CMQBTOI							35.924 /12 =2.994	

5. CONCLUSION AND RECOMMENDATIONS

The significance of bus terminals to the overall transportation system, urban development, and environmental sustainability cannot be overstated. Bus terminal facilities are widely recognized as crucial for promoting mobility, accessibility, and the overall functionality of cities. The demand for intercity bus terminal operations and services has been steadily increasing, particularly with passengers' day and nighttime requests, as well as freight handling. This growing demand has led to the development of various terminals, many of which are unstandardized in terms of facilities provision and services rendered, especially in Nigerian cities like Lagos.

As a result, many bus terminals, particularly those offering intercity travel within the study area, have compromised the quality of passenger holding areas, safety, and security within facilities, processing facilities (including ticketing and dispatching points), and express freight loading stations. In light of these challenges, this study assessed the quality of intercity bus terminals in Lagos metropolis, Nigeria, providing insights into the socio-economic profiles of users (commuters and operators), users' satisfaction with the quality of terminal facilities in terms of social, economic, and environmental factors, users' satisfaction with the quality of terminal services, and the challenges mitigating the quality of bus terminal operations in the study area towards improving the efficiency of services offered across various terminals in Lagos State and beyond.

This study on the quality of intercity bus terminals in Lagos State, Nigeria, revealed several key findings. Firstly, respondents identified various issues affecting the quality of terminals' operation, including air and noise pollution, sanitation problems, insecurity, and inadequate infrastructure. Secondly, most users expressed dissatisfaction with the overall quality of terminal services, particularly concerning facilities such as parking, waiting areas, ticketing processes, and cleanliness. Environmental concerns, such as air and water pollution, solid waste management, and poor drainage conditions, were also highlighted. Meanwhile, security emerged as a significant worry, with many respondents expressing concerns about crime, including theft and kidnapping, at terminals. Overall, the findings emphasized the urgent need for improvements in the location, design, and management of intercity bus terminals to enhance user satisfaction, safety, and environmental sustainability.

Given these findings, the study concluded that the provision of intercity bus terminal facilities and operations is vital for meeting the transport and mobility needs of various socio-economic groups. Therefore, there is a pressing need to improve the quality of intercity bus terminals in Lagos State. Consequently, the study recommends the adequate provision of more quality intercity bus terminals, especially at the urban fringe, to accommodate the ever-growing population. Basic economic and social-related intercity bus terminal facilities should be prioritized, including passenger holding areas, ticketing rooms, dispatching points, waiting rooms, express freight loading stations, and parking lots. These facilities should meet standard design and construction specifications. Additionally, essential environmental facilities and amenities within the terminal such as water supply, toilets, waste management systems, and electricity/power supply should be provided in adequate quantity and quality. Furthermore, road infrastructure connecting or serving intercity bus terminals and rights of way within terminal boundaries should be redesigned to accommodate intermodal systems, especially cycling and pedestrian pathways.

In terms of policy implications, it is imperative for the government to establish a dedicated agency under the authority of the Local Government Council to oversee the planning, management, and regulation of terminal facilities. This agency would be responsible for

ensuring the orderly arrangement of facilities, cost recovery mechanisms, service regulation, and infrastructural maintenance. Furthermore, there is an urgent need to formulate and implement a policy on Urban Bus Terminal Enhancement and Security Policy aiming to improve the quality of intercity bus terminals and enhance security measures to ensure the safety and satisfaction of passengers and stakeholders. Moreover, the involvement of the private sector in the provision and maintenance of terminal facilities should be encouraged to promote efficiency and sustainability. Policymakers should also prioritize the installation of traffic monitoring and surveillance devices to enhance security and safety within terminal premises. These policy measures will be instrumental in addressing the identified challenges and improving the overall quality and functionality of intercity bus terminals in Lagos and other urban areas in Nigeria.

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