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PASSENGERS' SATISFACTION WITH THE LAGOS SHUTTLE TRAIN SERVICES, LAGOS, NIGERIA

Summary. The study assessed passengers' satisfaction with the services of the Lagos Shuttle Train Services in Lagos, Nigeria. Two types of train, the Mass Transit Train (MTT) and the Diesel Multiple Unit (DMU), were covered. Using multistage sampling, 246 passengers were surveyed. It was found that the DMU passengers had higher socioeconomic profiles; the overall condition of the DMU was also better. Further analyses reveal that passengers' satisfaction differed for the train types: the MTT passengers were more particular about the operational environment, while the DMU passengers were concerned with both physical characteristics and the operational environment. Generally, passengers were

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satisfied with accessibility, coverage, fare, safety at station and onboard, security at station, and security of luggage; however, the Lagos Shuttle Train Services was found wanting on several key indicators. Recommendations are proffered towards enhancing the service quality of the Lagos Shuttle Train Services.

Keywords: Lagos Shuttle Train Services, Mass Transit Train (MTT), Diesel Multiple Unit (DMU), Passenger Satisfaction Index (PSI), service quality

1. INTRODUCTION

The indispensability of the railway as a transport mode for economic growth and development is widely acknowledged in both developed and developing countries around the world. Among the major advantages of the mode over other transport modes is its remarkable capacity to convey a large number of passengers and heavy goods safely and securely over long distances at a cheaper rate [23, 26, 27, 29]. Another important strength of rail transport is that it provides an opportunity for uninterrupted movements through busy streets and built-up areas with limited environmental and social disturbance. This makes it a suitable pivot of the transport system of any nation [16]. In many countries, the railway provides passenger services and also serves as the backbone of transit services in major cities [32]. According to the International Union of Railways (UIC) [37], globally, rail transport accounts for about 3,000 billion passenger-kilometres and 10,000 billion tonne-kilometres.

In Nigeria, for obvious reasons, railway transportation is generally considered the oldest transport mode [7, 26]. It started operation in 1901 with the Lagos-Ibadan line. However, it has hardly developed over the past 100-plus years compared to what occurs in developed countries [18]. This is partly due to the oversight by the government which led to the underperformance of the system. In other words, adequate attention has not been given to rail infrastructure in the country. Rather, a lot of attention has been given to the road and other transport subsectors. This is despite the general understanding that the country's road network was initially built to complement rail [23, 29]. The neglect of the rail subsector in Nigeria has been to the detriment of other transport modes, most notably the road subsector. The huge pressure created on the road transport subsector has resulted in traffic congestion and other pressing challenges. Worsening the matter is the underutilisation of the inland waterways, the infrastructure of which is grossly underdeveloped [26].

Not unlike other cities of the world, Lagos has been continually witnessing persistently growing transport demand. This has been consequent upon an unrelenting geometrically burgeoning population which is making the metropolis burst at the seams and the collateral problems thereof. Rail transport is one of the many attempts at mitigating the seemingly intractable traffic-associated problems in the city [19]. However, it is arguable that the rail transport system in Lagos has not been able to solve the problems. A testimony to this is the prevalent traffic chaos that has continued unabated in the state and assumed the status of a wicked problem [23].

Naturally, a correlation should be expected between a mode's efficacy and its ability to satisfactorily meet the yearnings of its passengers. Besides, an understanding of how a mode fares, in terms of passengers' assessment, goes a long way in assessing the effectiveness of such a mode. This calls for a thorough assessment of the level of satisfaction passengers derive from rail services in metropolitan Lagos. The rail system has been relied on in many nations for the world for mitigating transit challenges, especially those that relate to excessive demand. Thus, a look into what is making the Lagos an exception to the rule is imperative. Elsewhere, studies

have established a correlation between growing demand for rail services and a high level of passengers' satisfaction [10, 11, 15, 34, 36]. This implies that passengers' satisfaction with rail services is a key factor in the assessment of rail services.

A proper assessment of passengers' satisfaction with the service quality of train services can give an insight into how train services can be enhanced, and enhanced services can, in turn, greatly influence patronage [13]. With more passengers choosing the mode, the goal of mitigating metropolitan transport challenges, especially those associated with the inadequate road network, can be accomplished. Against this background, this study empirically assessed passengers' satisfaction with the Lagos Shuttle Train which serves a metropolitan area spanning two states, Lagos and Ogun, in Nigeria. This was achieved by the identification of important attributes that determine service quality of a transit system and assessing their relative importance and the satisfaction derived from them by the passengers.

2. PREVIOUS STUDIES

Studies abound on rail transport services, such as their operation and patronage. These studies include Agunloye and Ilechukwu [1], Irfan et al. [11], Odufuwa [17], Olayiwola et al. [20], Olojede [23], Olojede et al. [27], Oni and Okanlawon [29], and Salkonen and Paavilainen [34]. However, most of these studies did not get to assessing empirically established indicators of passengers' satisfaction with the services provided by rail transport. In addition, some of them were conducted in countries with different geographical, cultural and political milieux from Nigeria.

Specifically, Agunloye and Ilechukwu [1] examined the travel pattern and socioeconomic characteristics of rail transport passengers in Lagos Metropolis, Nigeria. The findings from the study revealed that most passengers were low-income earners, engaged in work-related trips, and made more trips per week because they depended highly on trains than any other mode. The study concluded that income, age, travel cost, and travel purpose influenced travel demand (trip frequency). Some other studies corroborated these findings, especially the reality that socioeconomic characteristics of passengers are important in assessing a transit service, and that they influence the satisfaction of passengers with the rail transport service [8, 9, 27, 36].

Olojede [23] examined the menace of train rooftop riding in Lagos Metropolis, Nigeria. Motivations for the daredevil act were determined using data obtained through participant observation, interview and questionnaire administration on passengers of both Diesel Multiple Units (DMU) and Mass Transit Trains (MTT), as well as all the 113 staff members of the Nigerian Railway Corporation. The study addressed, in a way, one of the critical factors that could influence the passengers' satisfaction rating of the railway service; however, the emphasis was not strongly on satisfaction assessment per se but rather on how the dangerous act of rain rooftop riding undermined the operations of the railway service.

Irfan et al. [11] examined satisfaction with service quality based on SERVIQUAL, which consists of seven variables: tangibility, assurance, timeliness, responsiveness, empathy, safety, food and communication. Their findings revealed that tangibility (the condition of coaches and station) was the only variable the passengers were satisfied with of all the variables examined. In addition, Rajeswari and Kumari [31] found that the service quality of a transit system is linked to the level of satisfaction derived by patrons of the system. In another study, Agunloye and Oduwaye [2] found that various factors that determine the quality of rail transport services and consequently passengers' satisfaction include arrival time, weekly trip frequencies,

cleanliness of the train, and smoothness of the ride. As found by Eric [9], other factors include fare, security, comfort, and waiting time.

Geetika [10] carried out an exploratory study on the determinants of customer satisfaction with the service quality of Indian railway platforms. The 16 variables considered were sufficiency of seating space, lighting, fans, drinking water and sanitation, clarity of announcements, accuracy of announcements, frequency of announcements, reservation chart display, affordability of refreshments, quality of refreshments, quantity of refreshments, security of self, security of luggage, behaviour of porters, behaviour of railway staff, and management of parking. The findings revealed that only five variables, which are refreshments, behavioural factors, information system, basic facilities and safety and security are considered important for determining satisfaction with railway platforms. The study concluded that the five identified factors are determinants of overall user satisfaction.

Nathanail [15] examined the quality of service for passengers on Hellenic railways. The study developed a framework that relied on the estimation of six criteria, which are itinerary accuracy, system safety, cleanness, passenger comfort, servicing, and passenger information. Each of these criteria was examined based on sub-indicators. Itinerary accuracy was evaluated through the delay and seating capacity of the coach. System safety was evaluated through two indicators, which are safety on board and safety at station. Cleanliness was evaluated through three indicators which are cleanliness of the station, train interior cleanliness, and train exterior cleanliness. Passenger comfort was also evaluated through three indicators, which are availability of air-conditioner, seat comfort and rest comfort. Servicing was evaluated through staff behaviour, staff appearance, frequency of service, quality and price of food, easiness of ticket purchase, speed, bed service, escorted vehicle service and ticket purchasing facilities. Passenger information was evaluated through pre-information provision, information at station and information provision on board. Findings revealed that passengers were very satisfied with system safety and itinerary accuracy, while they were dissatisfied with other criteria.

The work of Olayiwola et al. [20] focused on assessment of rail transport services on the Iddo-Ijoko corridor. The study examined rail traffic characteristics, level of service and quality of service. The variables used for quality of service are smoothness of ride, assistance for the disabled and elderly, cleanliness and maintenance, availability of train staff, punctuality, security of train, speed, frequency of train and comfort. Findings from the study revealed that passengers are dissatisfied with the quality of service. However, this study predated the introduction of the Diesel Multiple Unit (DMU) by the Lagos Shuttle Train Services in 2014. Thus, the analysis could not provide for the variations in the respective service satisfaction ratings of the Mass Transit Train (MTT) and DMU passengers.

Olojede et al. [27] examined the operation and patronage dynamics of the Lagos Shuttle Train Services. Six sets of respondents were surveyed over two survey periods—before the onset and in the wake of the COVID-19 pandemic—with passengers selected from both the Mass Transit Trains (MTT) and the Diesel Multiple Unit (DMU) trains operated along the Lagos Shuttle Train Services' corridor. Other respondents comprised the management of the Nigerian Railway Corporation (NRC) and all the engineers, conductors, and ticket vendors in the employ of the NRC. It was found that the operation dynamics of the metropolitan train services comprised both desirable and undesirable factors with direct implications for the effectiveness of the service. Another significant finding was that the operation and patronage dynamics of the train services would need to be improved on by the prioritization of the passengers' welfare. While this finding is directly relevant to satisfaction rating, the study did not prioritize it passengers' satisfaction in its analyses.

Olojede et al. [26] assessed the global competitiveness of the Nigerian rail system towards its repositioning. The study posited that the Nigerian rail system struggled in operations and patronage dynamics terms, and identified safety and security issues along with other principal factors that undermine the global competitiveness of the country's rail services. It further showed how the problems plaguing the Nigerian railway system have far-reaching consequences for the performance rating of the country's railway system. In addition, it indicated how several acts of terrorism and banditry have rendered rail services in Nigeria undesirable, with many Nigerians altogether avoiding railway transport in the country. However, the scope of the study did not cover the satisfaction analyses of passengers. Besides, the study was not empirically based.

Generally, most of the previous studies in the literature of rail passengers' satisfaction neglected one important aspect or the other while coming up with important findings on other important aspects. This is especially true of studies conducted in Nigeria and several other developing countries. The implication of this is that a single study that can afford us a comprehensive or holistic analysis of train passengers' satisfaction is hard to come by. Meanwhile, passengers' satisfaction goes a long way in the service rating of such a transport mode as the railway, and should be empirically investigated; hence, this study.

3. METHODOLOGY

3.1. The study setting

The Lagos Shuttle Train Services is domiciled in Lagos State, Nigeria. Lagos State is in the southwestern part of the country. It lies between Latitude 6°22' and 6°52' North and Longitude 2°42' and 3°42' East (Fig. 1). The state's southern boundary is formed by about 180 kilometres of the Atlantic coastline, while the western boundary is formed by the Republic of Benin. The northern and eastern boundaries are framed by Ogun State [12]. Lagos occupies an area of 3,577 square kilometres, thereby making it the smallest state by land area in Nigeria [6]. Lagos is made up of 20 local government areas. With an estimated population of 14 million (and still increasing), it is the most densely populated state in Nigeria [3, 33]. Consequently, the traffic situation in the state is characterised by heavy congestion, pollution, accidents, breakdown of transport infrastructure, and other negatives.

Lagos State is an important and major intra- and inter-city travel generation and attraction area in Nigeria. It is the state city in Nigeria where all modes of transport (road, rail, water and air) are adequately represented [23, 27]. The rail transport system in the state provides long-distance travel rail services and inter-city shuttle services. The long-distance travel rail service links the commercial southern part of the country with the settlements of the north, while the inter-city shuttle service runs from Iddo Terminus to Ijoko/Kajawla⁷ in Ogun State. Initially, the shuttle service featured only the MTT daily and conveyed passengers and freight from Iddo to Ifo Junction, Ifo to Idogo, and Ebute-Metta to Apapa [5, 19]. This arrangement was later reviewed, and the service was extended to Ijoko; however, passengers were only conveyed from Iddo Terminus to Ijoko in the afternoon [20]. Much later, the passenger service was extended to Kajawla, with an average of 10 MTTs daily. In 2014, three Diesel Multiple Unit (DMU) trains were introduced to improve the service [30].

⁷ *Kajawla* is an anglicized written version of *Kajola*, a Yoruba name that literally means 'Let's prosper together'

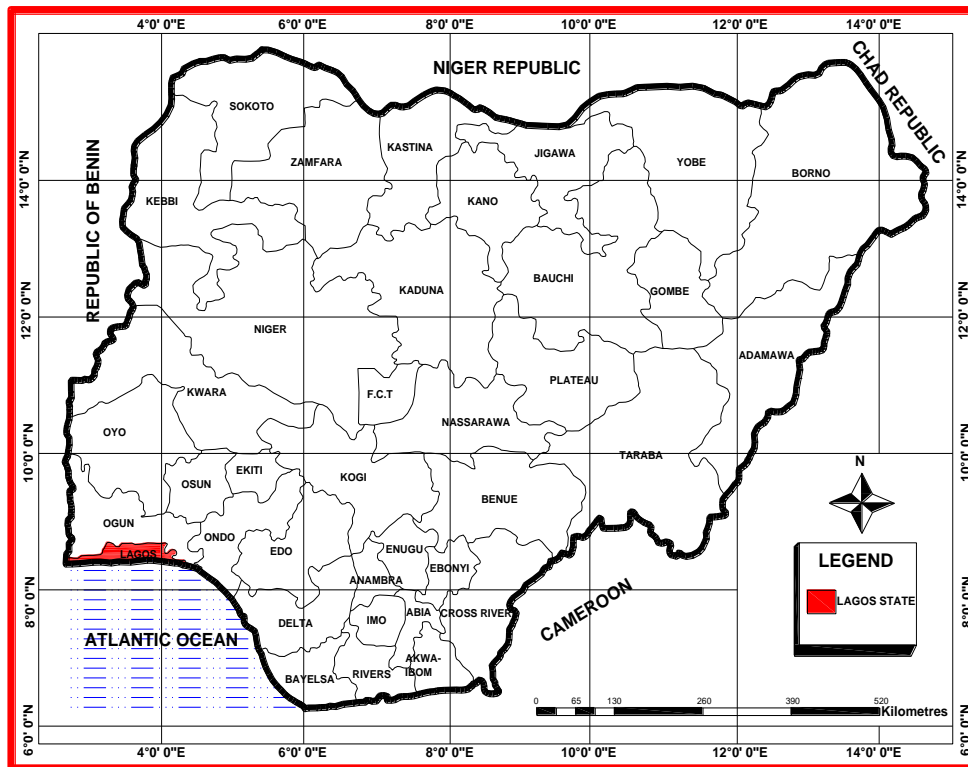


Fig. 1. Map of Nigeria Indicating Lagos State
Source: National Airspace Research and Development Agency

The Lagos Shuttle Train Services network falls within the Lagos Megacity Region (Fig. 2). However, it spans the two states of Lagos and Ogun with Iddo in Lagos Mainland Local Government Area of Lagos State and Ijoko in Ado-Odo/Ota Local Government Area of Ogun State. There are 14 train stations between Iddo and Ijoko/Kajawla four and 10 of which are in Ogun State and Lagos State respectively. Kajawla (KA), Ijoko (JK), Itoki (IT) and Agbado (GD) are the four stations in Ogun State while Iju Junction (UJ), Agege (GE), Ikeja (IK), Shogunle (SG), Oshodi (SH), Mushin (MU), Yaba (YA), Ebute-Metta (EB), Ebute-Metta Junction (EGJ) and Ido Terminus (DD) are the 10 stations in Lagos State. All these stations are stopping points for the transit service, where both loading and unloading of goods and passengers take place.

Generally, owing to its cheaper fare charges, the many coaches hauled and the seating capacity, the MTT is considered the economy train while the DMU is regarded as a first-class train because of the availability of air conditioning in coaches, as well as the few coaches, hauled and reduced seating capacity which makes it more expensive. The operation days for the Lagos Shuttle Train Services are Monday through Saturday. On each day, three shifts are run: the morning shift (0600-1400), the afternoon shift (1400-2200), and the night shift (2200-0600). As of the time of the survey, irrespective of the boarding station, the fare charged per trip either way was 230 naira (₦230) for the Mass Transit Train (MTT). Conversely, 300 naira (₦300⁸) was charged for the DMU during the off-peak period and 750 naira (₦750) during the peak period (0600-1259, 1300-1600 and 1601-2100 for the morning, afternoon and evening shifts respectively). The off-peak period is in the afternoon (1300-1600). The passenger flow

⁸ As of 27th February 2023, one US dollar (\$1) exchanges for 460.50 Nigerian naira (₦460.50)

for the MTT was at its peak in 2013 (almost 4 million). However, with the introduction of the DMU in 2014, the volume of passengers carried by MTT began to dwindle in a consistent manner.

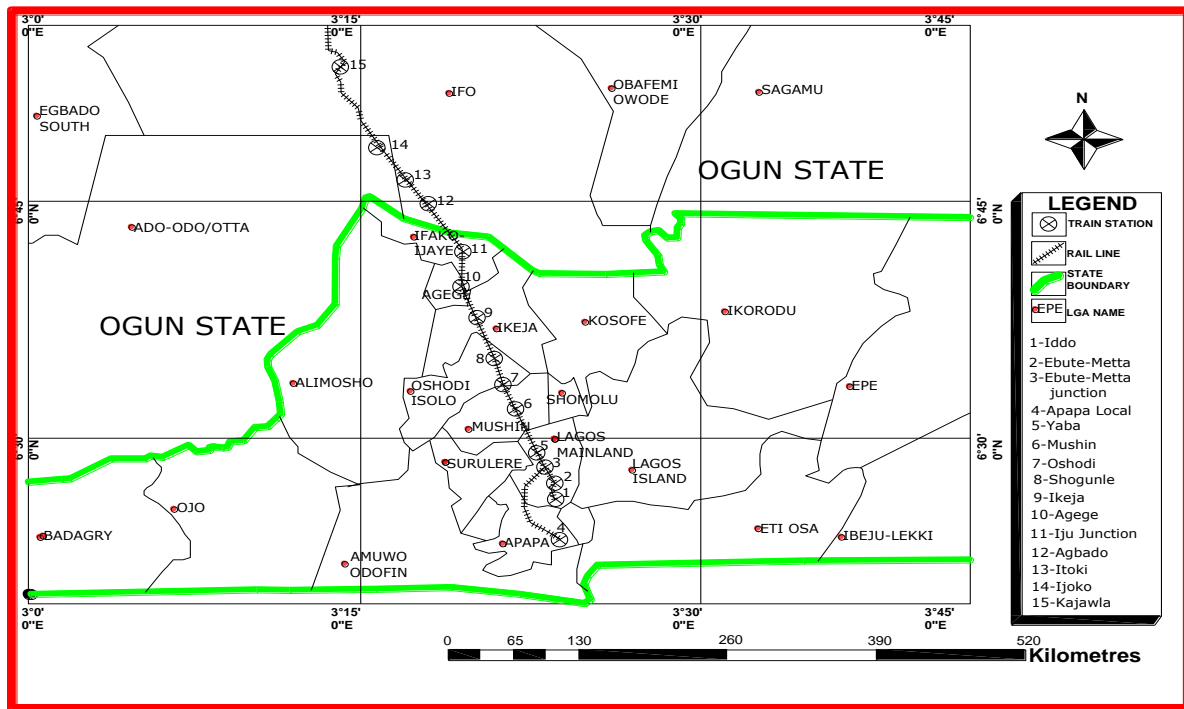


Fig. 2. Rail Network Map of Lagos Shuttle Train
 Source: Nigerian Railway Corporation (NRC, undated/unpublished)

3.2. Sampling procedure

The sample for the study was drawn from the passengers of the MTT and DMU trains along the Iddo-Ijoko and Iddo-Kajawla Route. There are three hours of service: Morning (M), Afternoon (A), and Evening (E). For the MTT, two, two and three trains are scheduled for the respective Morning, Afternoon, and Evening service hours. On the other hand, three DMU trains are scheduled for each service hour. Thus, a total of seven MTT and nine DMU trains take off from the Iddo Terminus daily. Each MTT has an average of 10 coaches hauled, and each coach has a seating capacity of 90; the DMU, on the other hand, hauls an average of three coaches each with a seating capacity of 72 for each coach. Thus, each MTT accommodates 900 passengers on the average, while each DMU accommodates 216 passengers.

For each service hour, 50% of the trains were selected for sampling. Thereafter, 5% of all the passengers were both randomly and judgmentally sampled across all the coaches of each selected train type. In all, 246 passengers were sampled: 180 from the MTT and 66 from the DMU. This is as summarized in Table 1. Questionnaires were administered to the sampled passengers.

Tab. 1

Summary of the Sampling Procedure

Train Type	Service Schedule			No. of Trains Selected (50%)			No. of Passengers in Selected Trains			No. of Sampled Passengers (5%)			Total
	M	A	E	M	A	E	M	A	E	M	A	E	
MTT	2	2	3	1	1	2	900	900	1800	45	45	90	180
DMU	3	3	3	2	2	2	432	432	432	22	22	22	66
Total	5	5	6	3	3	4	1,332	1,332	2,232	67	67	112	246

3.2. Data Analysis

Data obtained was analysed using crosstabulation, frequency distribution, percentages and Passenger Satisfaction Index (PSI). Respondents were requested to rate their level of satisfaction with factors that determine service quality on a five-point Likert-like psychometric scale [14, 38]: 1 being 'very dissatisfied' and 5 being 'very satisfied'. PSI was then computed using the average mean. The Weight Value (WV) for each criterion was obtained by the product of the number of responses for each rating to a variable and the respective weight of the value, which is expressed as:

$$WV = F_i V_i \quad (1)$$

Where WV was the weight value, F_i was the frequency of responses for variable i , V_i was the weight attached to responses on variable i , and i was the designated value of the Likert point response under consideration. The Sum of Weighted Value (SWV) for each variable was obtained by summing the product of the number of responses of each rating for a variable and the respective weight of the value, expressed as:

$$SWV = \sum_{i=0}^5 F_i V_i \quad (2)$$

Where SWV was the total weight value, F_i is the frequency of respondents rating for variable i and V_i was the weight attached to variable i , and i was the designated value of the Likert point response under consideration. The mean index for each variable was obtained by dividing the SWV of each variable by the total number of respondents ($N = 246$). This was computed as Passenger Satisfaction Index which is expressed as:

$$PSI = \frac{SWV = \sum_{i=0}^5 F_i V_i}{N} \quad (3)$$

The closer the PSI for any service indicator is to 5, the higher the general satisfaction of the passengers with the service indicator. Conversely, the closer the PSI for any service indicator is to 1 the lower the general satisfaction of the passengers with it. Similar uses of such a psychometric scale as this abound [4, 21, 22, 24, 28, 35].

4. RESULTS AND DISCUSSION

4.1. Passengers' attributes

Findings on the socioeconomic attributes of passengers patronising the Lagos Shuttle Train revealed a close proportional representation of both genders on the MTT (53.3% for male and 46.7% for female passengers), but a rather unsymmetrical proportion of the genders in the DMU (68.8% for male and 31.2% for female passengers). However, the pattern is similar for the age distribution of the passengers in both train types; the modal class falls in the 31-60 years group—72.6% for MTT and 85.4% for DMU. A higher proportion of DMU passengers (75.0%) had tertiary education, compared to the 58.5% of MTT passengers. This is also reflected in the income distribution of passengers on the two train types. A cursory look at Table 2 shows that, generally, the DMU passengers earned higher incomes than their MTT counterparts.

Tab. 2

Socioeconomic attributes of passengers

Attribute	Group	MTT (%)	DUT (%)
Gender	Male	53.3	68.8
	Female	46.7	31.2
Age	<18	2.2	0.0
	18-30	20.0	12.5
	31-60	72.6	85.4
	>60	5.2	2.1
Education	None	4.4	0.0
	Primary/Adult	3.0	2.1
	Junior secondary	5.2	0.0
	Senior secondary	28.9	22.9
	Tertiary	58.5	75.0
Income	<₦30,000	11.0	2.1
	₦30,000-₦59,999	43.4	14.3
	₦60,000-₦89,999	29.6	43.2
	≥₦90,000	16.0	40.4
Career	Schooling	10.4	6.2
	Civil service	36.3	6.2
	Private sector	37.8	79.2
	Retired	0.0	4.2
	Unclassified	15.6	4.2
Private Vehicle Ownership	None	38.7	3.2
	Motorcycle/Autorickshaw	11.4	2.1
	Car	47.5	90.9
	Other	2.4	3.8
Marital Status	Single	14.8	22.9
	Married	80.2	67.3
	Divorced/Widowed	3.7	6.3
	Other/Complicated	1.3	3.5
Household Size	1-3	17.0	29.2
	4-6	73.3	70.8
	>6	9.6	0.0

It is important to note that the majority (79.2%) of the DMU passengers had a private-sector career. The percentage of MTT passengers that belonged to this class was 37.8%. This finding is significant. It is common knowledge that effectiveness and productivity are strongly emphasized in the organized private sector. Besides, the organized private sector is the biggest employer in the study area. It also pays comparatively more. Thus, private-sector employees are more likely to take the DMU as it generally puts them in a kind of commuting elite class.

Another important variable of note in this analysis is private vehicle ownership. An overwhelming majority (96.8%) of the DMU passengers had private vehicles. Also, 90.9% of this class of passengers had at least one car. This compares conversely with the MTT passengers 47.5% of whom had a car. Table 2 also reveals that a higher proportion of the MTT passengers (80.2%) were married compared to the DMU passengers (67.3%). Also, post-marriage singleness owing to either the divorce or death of a marriage partner was more common among the DMU passengers. Generally, passengers of DMU had smaller households than passengers of the MTT. This finding further strengthens the elite class membership tendencies of the DMU passengers.

4.2. Passengers' level of satisfaction with Lagos shuttle train services

There is a strong connection between satisfaction derived from services provided by a transit system and its patronage. Service quality (a function of operation) can also be determined by the level of satisfaction of the passengers with the services provided [11, 31]. Using a five-point psychometric scale, passengers across the two train types were asked to express their satisfaction with the services provided by the Lagos Shuttle Train Services using 22 indicators. Their satisfaction with each of the provided services was measured using PSI. This analysis was first disaggregated for the two train types (Tables 3 and 4) before being aggregated for both (Table 5). The summary of the MTT passengers' responses is presented in Table 3.

Tab. 3

Respondents' satisfaction with MTT services

Service indicator	SWV	PSI	Deviation	Rank
Accessibility	500	3.70	1.04	1st
Fare	456	3.38	0.72	2nd
Security at the station	440	3.26	0.60	3rd
Safety at station and onboard	437	3.24	0.58	4th
Coverage	428	3.17	0.51	5th
Security of luggage	425	3.15	0.49	6th
Staff behaviour	424	3.14	0.48	7th
Service frequency	376	2.79	0.13	8th
Condition of the station	370	2.74	0.08	9th
Security personnel onboard	364	2.70	0.04	10th
Travel time	344	2.55	-0.11	11th
Ticket purchase	339	2.51	-0.15	12th
Cleanliness	336	2.49	-0.17	13th
Smoothness of ride	330	2.44	-0.22	14th
Conveniences (toilet)	325	2.41	-0.25	15th
Information provision	317	2.35	-0.31	16th

Punctuality	309	2.29	-0.37	17th
Track condition	306	2.27	-0.39	18th
Comfort	303	2.24	-0.42	19th
Embarkment/disembarkment	292	2.16	-0.50	20th
Train's physical appearance	284	2.10	-0.56	21st
Waiting time	203	1.50	-1.16	22nd

Based on the PSI values for the MTT passengers, satisfaction with accessibility was the service with the highest satisfaction rating. It is followed by fare, security at station, and safety at station and on board. Other service indicators with which the MTT passengers were satisfied were coverage, security of luggage, staff behaviour, service frequency, condition of station, security personnel on board, travel time, and ticket purchase. All these service indicators were scored higher than 2.5 of 5.0; this implies that the passengers were satisfied with them to some degree. However, other such service indicators as cleanliness, smoothness of ride, convenience, information provision, punctuality, track condition, comfort, embarkment/disembarkment, station's and train's physical appearance, and waiting time were scored below 2.5 of 5.0 by the passengers. This implies that they were not satisfied with them. With PSI values of 2.16, 2.10, and 1.50, the three service indicators with which the MTT passengers were least satisfied were embarkment/disembarkment, station's and train's physical appearance, and waiting time respectively.

Objectively viewed, the passengers' rating of these indicators could not have been otherwise. As observed during the survey, factors that could psychologically traumatize the passengers abounded. The coaches were overloaded with passengers; there was poor ventilation inside the coaches; hawkers operated inside the coaches; the engine was noisy; and the coaches dangled and swung noisily in motion. All these factors must have contributed to the discomfort and inconvenience of the passengers, negatively affecting their satisfaction rating.

Quite contrary to what obtained in the MTT, passengers in the DMU were generally more satisfied with the service provision. The summary of the DMU passengers' satisfaction in the rail service is presented in Table 4.

Tab. 4

Respondents' satisfaction with DMU services

Service indicator	SWV	PSI	Deviation	Rank
Accessibility	199	4.15	1.10	1st
Security at the station	184	3.83	0.78	2nd
Train's physical appearance	181	3.77	0.72	3rd
Coverage	178	3.71	0.66	4th
Fare	175	3.65	0.60	5th
Safety at station and onboard	167	3.48	0.43	6th
Security of luggage	165	3.44	0.39	7th
Travel time	163	3.40	0.35	8th
Service frequency	160	3.33	0.28	9th
Comfort	152	3.17	0.12	10th
Cleanliness	150	3.13	0.08	11th
Smoothness of the ride	149	3.10	0.05	12th
Waiting time	139	2.90	-0.15	13th

Track condition	137	2.85	-0.20	14th
Security personnel onboard	132	2.75	-0.30	15th
Conveniences (toilet)	128	2.67	-0.38	16th
Punctuality	124	2.58	-0.47	17th
Staff behaviour	122	2.54	-0.51	18th
Ticket purchase	109	2.27	-0.78	19th
Information provision	105	2.19	-0.86	20th
Condition of station	101	2.10	-0.95	21st
Embarkment/disembarkment	95	1.98	-1.07	22nd

According to the summary of satisfaction rating presented in Table 4, DMU passengers were satisfied with 18 of the 22 service indicators of the train type. The topmost three service indicators with which they were satisfied were accessibility (4.15), security at the station (3.83), and the physical appearance of the train (3.77). DMU passengers were also satisfied with coverage, fare, safety at station and onboard, security of luggage, travel time, service frequency, comfort, cleanliness, smoothness of ride, waiting time, track condition, security personnel onboard, conveniences, punctuality, and staff behaviour. In line with the observation made during the survey, the satisfaction rating of the DMU passengers could be owing to the relative better condition of service in the DMU. For instance, there were air conditioning, lighting, handholds for standing passengers, and wastebasket for proper waste disposal in the DMU coaches; conversely, these were missing in the MTT (Fig. 1a and Fig. 1b). Besides, the overall physical condition of the DMU appeared better than that of the MTT (Fig. 2a and Fig. 2b).



Fig. 1a. Typical MTT coach interior



Fig. 1b. Typical DMU coach interior



Fig. 2a. Typical MTT exterior



Fig. 2b. Typical DMU exterior

Table 5 presents a summary of the juxtaposed satisfaction ratings of the passengers in both the MTT and DMU. This juxtaposition brings out the variances in the satisfaction ratings of the two train types by their respective passengers. For ease of reference, the service indicators are alphabetically arranged.

Tab. 5

Respondents' satisfaction with the Lagos shuttle train services

Service Indicator	MTT		DMU	
	<i>SWV</i>	<i>PSI</i>	<i>SWV</i>	<i>PSI</i>
Accessibility	500	3.70	199	4.15
Cleanliness	336	2.49	150	3.13
Comfort	303	2.24	152	3.17
Condition of station	370	2.74	101	2.10
Conveniences (toilet)	325	2.41	128	2.67
Coverage	428	3.17	178	3.71
Embarkment/disembarkment	292	2.16	95	1.98
Fare	456	3.38	175	3.65
Information provision	317	2.35	105	2.19
Punctuality	309	2.29	124	2.58
Safety at the station and onboard	437	3.24	167	3.48
Security at the station	440	3.26	184	3.83
Security of luggage	425	3.15	165	3.44
Security personnel onboard	364	2.70	132	2.75
Service frequency	376	2.79	160	3.33
Smoothness of the ride	330	2.44	149	3.10
Staff Behaviour	424	3.14	122	2.54
Ticket purchase	339	2.51	109	2.27
Track condition	306	2.27	137	2.85
Train's physical appearance	284	2.10	181	3.77
Travel time	344	2.55	163	3.40
Waiting time	203	1.50	139	2.90

A cursory glance at Table 5 shows that the MTT passengers rated their satisfaction with the services provided by the Lagos Shuttle Train Services better than their DMU counterparts only on five of the 22 service indicators examined: condition of station, embarkment / disembarkment, information provision, staff behaviour, and ticket purchase. A closer look at these five service indicators rated high by the MTT passengers suggests that the MTT passengers' dissatisfaction were more with the operational environment of the Lagos Shuttle Train Services rather than the trains themselves. This tends to imply that, ordinarily, the MTT passengers would not have high expectations about the physical condition of the trains in which they were being conveyed, probably because they were aware that the fare, they were being charged could not possibly support satisfactory shuttle train services. On the other hand, the DMU passengers likely tended to think that they were getting value for their money, as their satisfaction ratings showed comparative higher values for service indicators that had to do with both the physical condition of the trains and the operational environment of the Lagos Shuttle

Train Services. In other words, their satisfaction ratings suggest that beyond the physical characteristics of the train, they considered important other service indicators that relate to the operational environment of the Lagos Shuttle Train Services.

Generally, both the MTT and DMU passengers rated their satisfaction with accessibility, coverage, fare, safety at station and onboard, security at station, and security of luggage above 3.0 of 5.0 (over 60%). This implies that, generally, passengers patronizing the Lagos Shuttle Train Services were quite satisfied with these service indicators. In other words, as perceived by the passengers, the services and stations were easily accessible, the train services covered a wide area of the metropolis, the fare was fair, both the stations and trains were safe, the stations were secure, and the passengers' luggage was secure. In addition, observation during the survey indicates that information provision to the passengers was bad, the schedules were not followed, and most passengers spent more than an hour waiting for a train at the station as the trains were seldom on time. This might account for the generally low rating given to corresponding service indicators by the passengers.

The finding on safety and security attributed to the Lagos Shuttle Train Services is important considering the embarrassing situation of transport safety and security in Nigeria, especially rail transport. Specifically, Olojede et al. [26] decried the insecurity and unsafety that characterized the rail transport system in Nigeria. Nevertheless, the variance in the findings of this study and those of Olojede et al. [26] could be explained to be owing to the difference in the respective spatial scopes of the two studies; whereas Olojede et al. [26] covered the entirety of Nigeria, this study is limited to the metropolitan Lagos.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study found that, generally, variation existed in the socioeconomic profiles of the MTT and DMU passengers, with the latter group on the upper rung of the socioeconomic ladder. It was also found that the condition of the DMU was better than that of the MTT. Consequently, the satisfaction derived from the services provided by the Lagos Shuttle Train Services differed across the MTT and DMU. Whereas the MTT passengers were more particular about the service indicators that relate to the operational environment of the Lagos Shuttle Train Services, the DMU passengers' satisfaction indices covered both the physical characteristics of the trains and the operational environment of the Lagos Shuttle Train Services. Generally, both the MTT and DMU passengers rated their satisfaction with accessibility, coverage, fare, safety at station and onboard, security at station, and security of luggage high. However, the findings also suggest that, generally, information provision to passengers was bad, schedules were not followed, and most passengers spent more than an hour waiting for a train at the station as the trains were seldom on time.

Evidently, the findings from this study could inform policies towards the overhauling of the Lagos Shuttle Train Services. With the low level of passengers' satisfaction with some important service indicators, it is important that a comprehensive improvement plan be embarked on. Among other steps, both the physical characteristics of the trains and the operational environment of the Lagos Shuttle Train Services should be revamped. In addition, the physical condition of the MTT should be upgraded through retrofitting with at least some of the desirable features of the DMU. This may lead to the upward review of the fare charged by the MTT; however, it would make for both better service provision and financial sustainability.

The management of the Lagos Shuttle Train Services should work towards improving on its information dissemination to passengers. Also, schedules should be strictly followed so that passengers would not be wasting their precious time waiting for a train at the station. Meanwhile, all the highly-rated service indicators should be conscientiously evaluated for improvement, as there is always room for improvement. Moreover, as it generally applies to all public transport outlets in the post-COVID-19 period, pandemic preparedness should be accorded top priority in any plan for the future. This is pertinent as public transport systems have been proved to be veritable vehicles for pandemic transmission. Most importantly, relevant stakeholders in the Nigerian railway system should seriously work towards global competitiveness. This is because the best that currently exists in Nigeria in terms of operation and patronage dynamics had been written off years and decades ago by many countries as being obsolete.

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