

# Operational Characteristics of Public Transportation in Jos Metropolis, Nigeria.

**OWOEYE, Adelanke Samuel, YAKUBU-WOKILI Hauwa'u, JATAU, Solomon Usman, ONI, Babatope Gabriel & JATAU, Nicholas**

Corresponding email: lankiedudu@yahoo.com & ade.owoeye@futminna.edu.ng

Department of Logistics and Transport Technology,

School of Innovation Technology,

Federal University of Technology, Minna, 920211, Niger State, Nigeria.

---

## Abstract

The mobility of people and materials especially in the present days is one of the greatest challenges facing public transport services in an urban area. Thus, necessitate the investigation into the operational characteristics of public transportation in Jos Metropolis, Nigeria. The inquiry into the operational characteristics of public transportation in Jos was done via the collection of primary and secondary data and the primary data were analyzed using descriptive statistics. The primary data were obtained through administering of questionnaires to commercial transport operators at 2 selected bus parks, 3 motor Parks, 7 Tricycle parks and 5 motorcycle stand points. Oral interview was also done on commercial transport operators to extract necessary information in relation to the aim and objectives of the study. Findings revealed that majority (77.3%) of public transport operators in Jos falls below 41 years, 93.3% earns between N1,000 to NN80,000 monthly, 48.5% were married while, 89% were literate, 58% of public transport vehicles were owned by individuals with 35% overloading of buses occurring at peak periods during week days. This study therefore, recommends that in Jos metropolis, Government should encourage and introduce the use of high occupancy vehicles as a means of public transport at designated traffic corridors to increase carrying capacity of vehicles in order reduce waiting time of passengers at bus parks. Also, avenues for soft loan scheme must be encouraged to help prospective operators in order to be able to afford buying vehicles for public transport services. Finally, corporate organization must be pressed on their social responsibilities, in order to invest in high-capacity buses and their smooth operations within the rules of the country.

Keywords: Public Transport; Parks; Vehicle; Operation; Metropolis.

---

## 1. Introduction

Road transportation is a necessary end right from early history. The mobility of people and materials especially in the present days become one of the greatest needs that have to be adequately satisfied in our society and economy at large (Raoniar, Rao & Senathipathi, 2015). This means that without transportation management system, the entire economy will suffer stagnation. Transportation helps to bridge the gap between producers, suppliers and

industrial users as well as individual commuters. Transport has been likened to the human blood circulatory system whose healthy functioning is a necessary condition for the sustenance of human life (Budiono, 2009). Transport systems provide a key to the understanding and operation of many other systems at any different scales (Beirao, 2007).

Transportation is a process that involves the movement of commuters, goods and services from a given point of origin to a specific destination (Okoko, 2006). Transport provides essential communication between the advanced and developing worlds. Transportation is a process that involves the movement of commuters, goods and services from a given point of origin to a specific destination (Aworemi, Abdul-hazeez & Olaogun 2006). While, public transport is all modes of transportation available to the public irrespective of ownership (White, 2002). Common modes of public transport include buses and minibuses, shared taxis, converted pick-up vans, motor scooters (auto rickshaws) and pedal rickshaws (Adesanya, 2011; Muhammed, 2015)). The dominant mode of public transport in developing countries is road-based. Public transport as an integral back bone of urban life is one of the factors which determine the form and socio-economic development of a city (Santhakumar, 2003).

The importance of public transport stemmed from the fact that it provides mobility for those who cannot afford to buy a car and helps in creating and maintaining livable communities by relieving highway congestion and assuring long term sustainability in terms of resource consumption and the environment (Nurul-Habib, Kattan & Islaam, 2009). Transportation provides a very efficient means of moving large number of people with considerable flexibility in order to meet demand throughout the city. It plays a key role in shaping urban and rural landscape through its influences on the form and size of settlements, the style and pace of life by facilitating trade, permitting access to people and resources, and enabling greater economies of scale (Banjo, 2008). Problems pervading urban transport sector in most developing countries range from inadequate and poor quality of infrastructures, mismatch between demand and supply to increased rate of accident. The problems are triggered by interrelated trends such as urban population growth; rapid, unplanned and uncoordinated growth of cities.

One of the most common modes of public transport in Jos metropolis is the minibus. In a number of major Nigerian cities, the minibuses carry up to 70% of municipal passengers, Kaduna, Kano, and Ibadan for instance. The benefits of the minibus as a public transport mode have been the focus of a continuing debate in both developed and developing

countries. At the centre of the debate is whether regulation or deregulation of stage bus is more beneficial to the travelling public. At one extreme is the complete ownership of public transport companies and at the other, the complete ownership by private proprietors or driver-ownership. In between however, there is a wide range of ownership and control mechanisms. Proponents of deregulation argue that cost savings, more efficient and effective service for users will result from the development of a competitive market. (Brendan, Amal & Samson 2011)

The activities of most transport operators in Plateau State, most especially the Jos Metropolis has left so much to be desired, as public transport operators use the loophole in the transport system to engage in criminal activities under the guise of transporters. While, the commuters are left at the mercies of the transport unions with little or no government thorough supervision to regulate the operations of public transport in the city. Moreover, majority of the public transport operators in Jos Metropolis comprises of small sized vehicles which are owned and operated by low-skilled young men who migrated to cities from the countryside (Dimitrious, 2016).

The increase in population has caused an increase in the demand for mobility. If public transport infrastructure is not capable of meeting the demands, this could lead to an increase in waiting times and congestion in public transport and streets. An attainment of reliable transport system in any country could best be realized through a precise understanding of the dynamism involved in the system (Ogbazi, 1992). Most transport companies in Nigeria offer poor service quality, poor maintenance of fleet and unsafe services. Big share of the vehicle fleet consists of second-hand vehicles purchased from industrialized countries, while, the ages of the vehicles are quite old and there is a low maintenance budget. Reliability, convenience and travel time are considered to have a great impact on passenger satisfaction in relation with the type of the trip, but most transport companies do not take it seriously (Raoniar, Rao, & Senathipathi, (2015). This research seeks to assess the operational characteristics of public transport in Jos's metropolis in order to unravel public transport mode operandi and unravel the composition of public transport operators and other underlying changes being faced by the operators.

## **2. Literature Review**

Transportation is super essential for human to run and carry out our activities effectively. It forms the basis of all socioeconomic interactions (Nwafor & Onya 2019). In many

developing countries, deficit in transport facilities often obstruct economic development. An effective transport system is essential to support economic growth and development. Dilapidated roads, inefficient fleets of vehicles, inadequate trains, overcrowded airplanes and congested ports are common features of developing world transportation system. Physical problems such as untrained transport managers and planners, capital restructuring and bureaucracies, ineffective traffic regulations exist. Generally, transportation is the actual physical movement of people and goods from one place to another (Chengming, Yanyan & Changxi, 2014).

Buses are very flexible for routine services and have efficient time keeping. Bus services offers several advantages compared to other public transport modes, such as high accessibility and mobility, operating costs that are beneficial for short-trips, easy and uninterrupted lane movement and relatively low maintenance costs. Bus service is best in meeting the transport requirements in terms of fare and flexibility and is thought to be especially favorable to the poor (Tolley 1988). Prior to the introduction of the mass transit in 1988 in Nigeria, several urban centres were already being served by conventional: mini-buses, taxis and adapted vehicles known as “molues” particularly in Lagos (Ikya, 1993). There were many public transport problems due to severe deterioration of roads, insufficient and poor public transport vehicles with poor maintenance, high rate of breakdown, very low speed and insufficient capacity which in turn has produced inadequate services (Tyson 1991).

Buses offered more convenient door to door service or dropped passengers on request at specific not predetermined stops (Fadare 1998). However, many of the vehicles used as informal public transport were noisy, smoky, rickety and jolty which posed specific environmental problems to the road users and non-road users alike (Fadare 1998). In most cases high accident rate was recorded among para-transit operators (Bolade, 1991), revealing the operators’ carelessness and low level of training. During the past two decades, a huge population growth is recorded in developing countries (Buhaug and Urdal, 2013). The increase in population has caused an increase in the demand for mobility. If the transport infrastructure is not capable of meeting the demands, this causes an increase in waiting times and congestion in public transport and streets (Samek Lodovici and Torchio, 2015). Public transport can be more attractive by providing "Door to door mobility" and development of transportation services is an important factor of social quality (Yatskiv et al, 2017).

This can be seen as a means by which goods (raw material, production equipment,

operating inventories, semi-finished goods and finished goods) as well as people are able to get to or be made available where they are needed for commercial or non-commercial purposes, as at when desired. The mobility of people and materials is therefore one of the greatest needs that have to be adequately satisfied in any society if any meaningful level of social interaction, co-operation, production activities, economic and other types of development and the enhancement of human welfare is to be achieved. Aigbedion, Salihu & Omoruyi, 2015). This is the reason why road transport is popularly referred to as the engine and wheel of the society. It helps the world to go round and function actively.

### 3. The Study Area

Jos is a city in in North-Central Nigeria, popularly called "J-Town". This is the state capital of Plateau state. Jos is a pear-shaped upland known as Jos Plateau. This upland stretches for approximately 104km. from north to south, and 80km. from east to west, covering an area of about 8,600km<sup>2</sup> or 860,000 hectares. Characterized by impressive ridges and isolated rocky hills separated by extensive plains, the Plateau exhibits a variety of land forms which provide excellent picnic resorts. It maintains an average height of 1,200m. (4,000 Ft.) above sea level, and reaches its highest peak in the Shere Hills where it stands at 1,766m (5,829 Ft.). The city is located on the Jos Plateau at about 1,238 metres or 4,062 feet above sea level. It is the administrative capital and largest city in Plateau State.. During British colonial rule, Jos was an important centre for tin mining and is the trading hub of the state as commercial activities are steadily increasing.

Jos was originally established in 1915 as a tin transportation camp and its early history was closely linked to the prosperity of the tin mining industry. In term of administration Jos is divided into Jos North LGA and Jos South LGA. Jos North is a Local Government Area in Plateau State Nigeria. Its headquarters are in the city centre of Jos. It has an area of 291 km<sup>2</sup>. The city has a population of about 429,300 based on the National population census conducted in 2006 with Hausa Fulani, Afizere, Anaguta, and Berom as indigenous tribes. While, Jos South also A Local Government Area in Plateau State, Nigeria. It houses the Governor's Office in Rayfield and can thus be described as the de facto capital of Plateau State. Its headquarters is located in Bukuru town on 9°48'00"N 8°52'00"E.



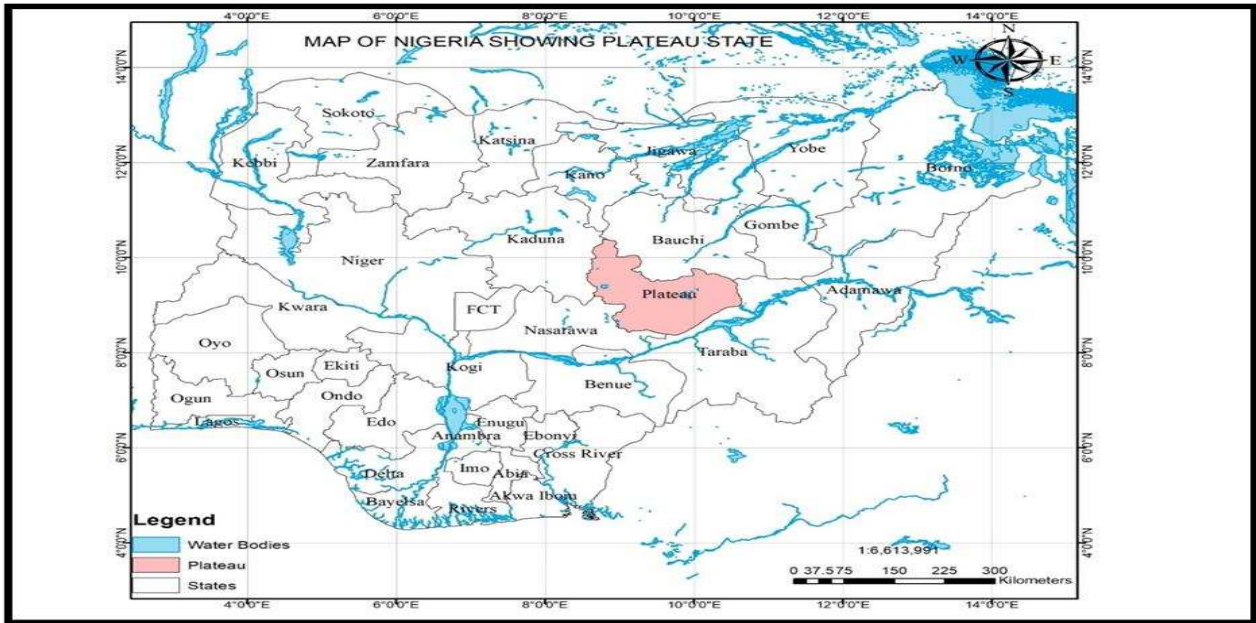


Figure 1: Map of Nigeria showing Plateau State

Source: Department of Logistics and Transport Technology, FUT, Minna (2021)

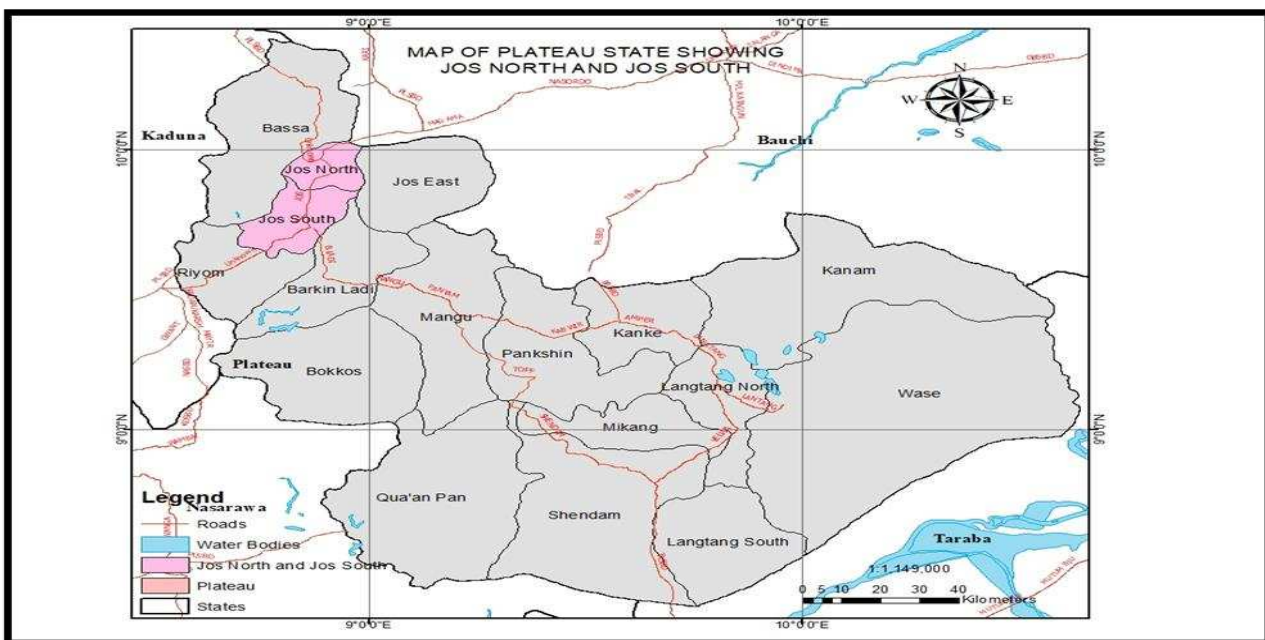


Figure 2: Map of Plateau State showing Jos Metropolis

Source: Department of Logistics and Transport Technology, FUT, Minna (2021)

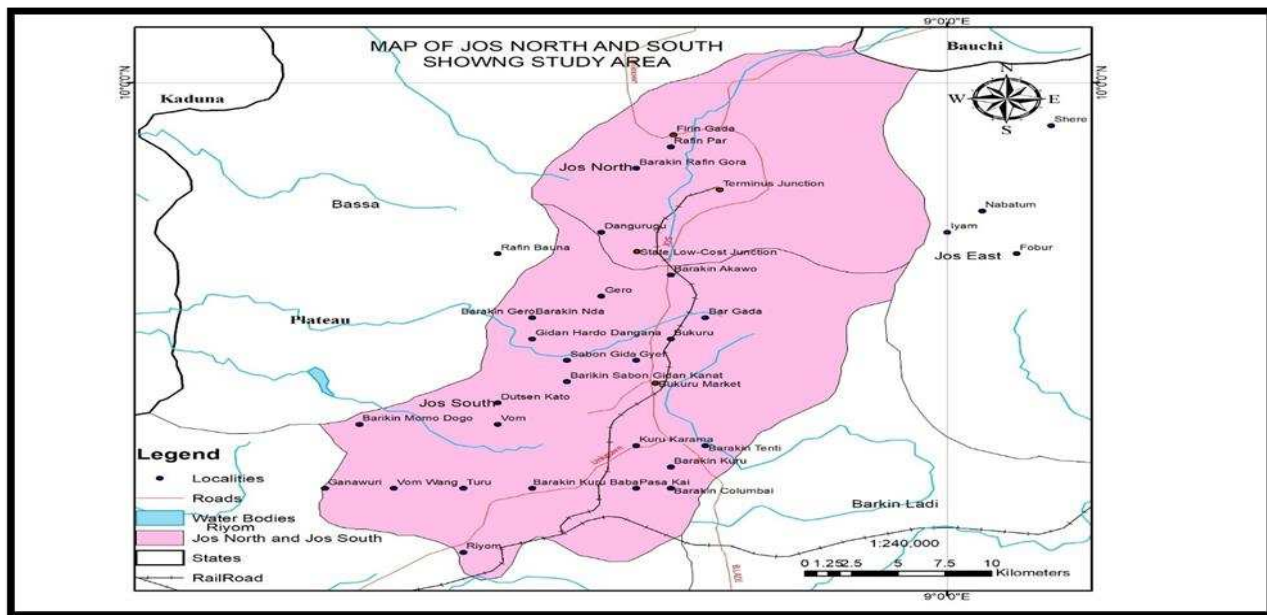


Figure 3: Map of Jos North and Jos South showing study areas

Source: Author's Field Survey (2021)

#### 4. Methodology

The research adopted for this study is survey method using the mixed research design to gather data related to this study. This study relies on both secondary and primary data. The primary source of data were the public transport drivers within Jos metropolis and this was achieved through the administration of questionnaires and personal interviews to commercial Transport operators from 2 bus parks, 3 motor Parks, 7 Tricycle parks and 5 motor cycle stand points. Oral interview was done on commercial transport operators to extract necessary information in relation to the aim and objectives of the study. The secondary data was collected from already existing sources which includes the internet, journals and other research works that are relevant to the research topic.

Three hundred and twenty-six (326) copies questionnaire were systematically administered to public transport operators in Jos Metropolis. The Two selected bus parks are, Bukuru Bus Park, and Vom Bus Park. The Three selected motor parks are the Vom Motor Park, New Bukuru Park and Rukuba Park. While seven tricycle Parks selected are the; Terminus Park, Old Airport Park, Sparkling Juncton, Farin Gada Park and Gada Biyu Park. Finally, five commercial motorcycles stand point were also, selected which includes; Angle D,

Low-cost Junction, First Bank Bukuru, Zarmaganda Junction, PRTV Junction and Vet K Vom Junction.

## 5. Data Analysis Presentation and Discussion

### 5.1 Analysis of Socioeconomic Characteristics of the Respondents

**Table 1: Age Category of Public Transport Operators in Jos**

| Age categories | Frequency | Percent |
|----------------|-----------|---------|
| 11-20          | 89        | 27.3    |
| 21-30          | 105       | 32.2    |
| 31-40          | 58        | 17.8    |
| 41-50          | 38        | 11.7    |
| 51 above       | 36        | 11.0    |
| Total          | 326       | 100.0   |

*Source: Author's Computation (2021)*

The result of the field survey shows the public transport vehicles age categories. Table 1 shows age category of public transport operators in the study area with about 77.3% captured within the age groups of 11-40 years old while 41 years and above have about 22.7%. The implication of this findings is that in Jos, public transport services are mostly operated by the youthful age categories and the decision for public transport operations would mostly be influenced by the youths.

**Table 2: Gender of public transport operators in Jos**

| Gender of respondents | Frequency | Percent |
|-----------------------|-----------|---------|
| Male                  | 326       | 100.0   |
| Female                | 0         | 0       |

*Source: Author's Computation (2021)*

The survey assessed the gender of public transport operators in Jos. From Table 2 findings shows that all the public transport operators that was assessed via the administration of the questionnaires were males which accounts for 100% response. This finding implies that public transport operators in Jos metropolis is predominantly male dominated venture. This



can be attributed to the nature and culture of the northern people which places the male gender as a public figure and the female gender to domestic activities or in charge of home affairs.

**Table 3: Monthly Income of Public Transport Operators in Jos**

| Weekly income |                 | Frequency | Percent |
|---------------|-----------------|-----------|---------|
| Valid         | N1,000-20,000   | 56        | 17.2    |
|               | N21,000-40,000  | 135       | 41.4    |
|               | N41,000-60,000  | 73        | 22.4    |
|               | N61,000-80,000  | 40        | 12.3    |
|               | N81,000-100,000 | 18        | 5.5     |
|               | N100,000 above  | 4         | 1.2     |
|               | Total           | 326       | 100.0   |

Source: Author's Computation (2021)

The result of the field survey shows monthly income of public transport operators. Table 3 shows N1,000-N20,000 represents 17.2%, N21,000-40,000 (41.4%), N41,000- N60,000 (22.4%), N61,000-N80,000 (12.3%), N81,000-100,000 (5.5%) while N100,000 above (1.2%). The implication of this is that 93.3% of Jos public transport operators earns between N1,000 to NN80,000 monthly. This also means that the public transport operation system is a major source of income that could bring about improvement in living standard and be a veritable source of income for interested individual if well managed and regulated.

**Table 4: Marital Status of Public Transport Operators in Jos**

| Marital status |          | Frequency | Percent |
|----------------|----------|-----------|---------|
| Valid          | Single   | 120       | 36.8    |
|                | Married  | 158       | 48.5    |
|                | Divorced | 48        | 14.7    |
|                | Total    | 326       | 100.0   |

Source: Author's Computation (2021)

The result of the field survey shows the marital status of public transport operators in Jos metropolis. Table 4 shows that singles (36.8%), married (48.5%) and divorced (14.7%). The implication of this marital status is that the Jos public transport system operators are mostly married with wives and children to be taken care of. As a result of responsibilities

attached to the operator, they would have to go on daily basis to search for means of livelihood. Hence public transport system operations create an avenue for the single, married and even the separated persons to generate income for their selves.

**Table 5: Educational Qualification of Public Transport Operators in Jos**

| Educational qualification |             | Frequency | Percent |
|---------------------------|-------------|-----------|---------|
| Valid                     | Primary     | 79        | 24.2    |
|                           | Secondary   | 143       | 43.9    |
|                           | NCE         | 39        | 12.0    |
|                           | BSc/B.Tech. | 29        | 8.9     |
|                           | PGD         | 18        | 5.5     |
|                           | MSc/M.Tech. | 14        | 4.3     |
|                           | Ph.D.       | 4         | 1.2     |
|                           |             | 326       | 100.0   |

*Source: Author's Computation (2021)*

Table 5 reveals that majority of public transport operators' (89%) had up to first degree educational qualification, with primary (24.4%), secondary (43.9) NCE (12%) BSc/B.Tech. (8.9%) PGD (5.5%) MSc/M.Tech (4.3%) Ph.D. (1.2%). The implication of this findings is that there is high literacy among transport operators in Jos. Due to the high unemployment rate and difficulties in finding white collar jobs many graduates could result to being public transport operators so as to sustain themselves and their Families. Hence, the public transport operations serve as a means of employment for teaming Nigerian youths.

## 5.2 Driving Experience of Public Transport Operators in Jos

| Table 6: Driving experience |                  | Frequency | Percent |
|-----------------------------|------------------|-----------|---------|
| Valid                       | Less than 5years | 65        | 19.9    |
|                             | 6-10years        | 112       | 34.4    |
|                             | 11-15years       | 108       | 33.1    |
|                             | 16 years above   | 41        | 12.6    |
|                             | Total            | 326       | 100.0   |

*Source: Author's Computation (2021)*

The result of the field survey shows the public transport operators' driving experiences. Table 6 shows that operators with less than 5years (19.9%), 6-10years (34.4%), 11-15years

(33.1%) 16years and above (12.6%). The implication of this results is that the majority of the public transport operators in Jos are experienced drivers.

### 5.3 Vehicle Category of Public Transport Operators in Jos

|       |                 | Frequency | Percent |
|-------|-----------------|-----------|---------|
| Valid | Mini bus driver | 84        | 25.8    |
|       | Taxi driver     | 78        | 23.9    |
|       | Tricyclist's    | 98        | 30.1    |
|       | Motorcyclist    | 66        | 20.2    |
|       | Total           | 326       | 100.0   |

Source: Author's Computation (2021)

The researcher benchmarked transport operators based on vehicle categories into four which includes Mini bus drivers, taxi drivers, tricyclist's and motorcyclists. Findings in Table 7 indicates that Mini Bus driver (25.8%), Taxi driver (23.8%), Tricyclist's (30.1%) while Motorcyclist (20.2%). The implication of the findings is that in Jos majority of public transport operators make use of tricycle for public transportation, because of the level of flexibility and low maintenance cost it offers.

### 5.4 Forms of Ownership of Public Transport Operators in Jos

|       |                          | Frequency | Percent |
|-------|--------------------------|-----------|---------|
| Valid | Individual               | 191       | 58.6    |
|       | Cooperatives/Association | 12        | 3.7     |
|       | Corporate body           | 75        | 23.0    |
|       | Government schemes       | 21        | 6.4     |
|       | Hire-purchase            | 13        | 4.0     |
|       | Bank loan                | 8         | 2.5     |
|       | Others                   | 6         | 1.8     |
|       | Total                    | 326       | 100.0   |

Source: Author's Computation (2021)

The result in Table 8 shows that majority (58%) of public transport vehicles used in Jos metropolis was individually owned. While 23% of public transport vehicles are owned by corporate bodies. The implication of this form of ownership in Jos metropolis is that the public transport system could be vulnerable to disruption as these private operators could

easily withdraw their services from the road or change their routes without any prior warning to commuters who depend on their services.

### 5.5 Period of Overloading of Public Transport Operators in Jos

| <b>Table 9: Overloading</b> |                          | <b>Frequency</b> | <b>Percent</b> |
|-----------------------------|--------------------------|------------------|----------------|
| Valid                       | Peak period of week days | 114              | 35.0           |
|                             | Every time of week days  | 65               | 19.9           |
|                             | During weekends          | 75               | 23.0           |
|                             | Occasionally             | 72               | 22.1           |
|                             | Total                    | 326              | 100.0          |

Source: Author's Computation (2021)

Table 9 reveals that 35% of public transport operators in Jos involves in overloading of their vehicles mostly during peak periods of the week days followed by weekends when transport unions and traffic officers occasional will not be on duty in order to cash in on the extra cash that accrues. The implication of this is that carrying more than the maximum capacity of the vehicles could lead to loss of control and accidents which could invariably leads to loss of lives.

### 5.5. Maintenance Practices of Public Transport Operators in Jos

**Table10 Vehicle Maintenance**

| Practices                                    | N   | Sum     | Mean   | Decision |
|--|-----|---------|--------|----------|
| Acquainting yourself with the owner's Manual | 326 | 1220.00 | 3.7423 | Agree    |
| Checking of your tires monthly/ weekly       | 326 | 1213.00 | 3.7209 | Agree    |
| Changing the oil and filter on schedule      | 326 | 1217.00 | 3.7331 | Agree    |
| Replacing the air filter with oil changes    | 326 | 1214.00 | 3.7239 | Agree    |
| Inspection of all other fluids               | 326 | 1210.00 | 3.7117 | Agree    |
| Examining the belt and hoses                 | 326 | 1210.00 | 3.7117 | Agree    |
| All listen and feel for brake Tissues        | 326 | 1212.00 | 3.7178 | Agree    |
| Replacing of wiper blades as needed          | 326 | 1214.00 | 3.7239 | Agree    |

|                               |     |         |        |       |
|-------------------------------|-----|---------|--------|-------|
| Removing of battery corrosion | 326 | 1124.00 | 3.5065 | Agree |
|-------------------------------|-----|---------|--------|-------|

Source: Author's Computation (2021)

The result in Table 10 shows that operators agreed to all the nine indicators benchmarked to assess the maintenance practices of public transport operators with all scaling above the minimum means value. This could be as a result of their high literate and response level to routine maintenance culture. The implication of this is that there will less breakdown of vehicles while in operation which will lead to longevity in usage and good service delivery to commuters.

## 6. Conclusion

In conclusion, this study has shown the current operational characteristics of public transport operation in Jos is mainly male dominated, privately owned, high literacy rate with a good number of transport operators within the ages of 21-30years. The study also deduced that the public transport operation is a lucrative business in the study area with high profit rate.

## 7. Recommendation

The researcher therefore recommends the following;

- i. Government should create an avenue for soft loan schemes to encourage prospective operators in order to be able to afford buying vehicles for public transport services.
- ii. The incidents of overloading by public transport operators must be met with huge fines and strict safety rules and measures to deter violators and others.
- iii. Government should encourage and introduce the use of high occupancy vehicles at designated routes to increase carrying capacity of vehicles in order to reduce waiting time at bus parks.
- iv. Government should create an enable atmosphere to encourage citizens involvement in the business of public transport operation in order to reduce social vices in the society.
- v. corporate organization must be pressed on their social responsibilities, in order to invest in high-capacity buses and their smooth operations within the rules of the country.

- vi. taxi owners can be encouraged to diversify into bigger (7-seater cars) and mini-buses.
- vii. Moving towards electric vehicles may be considered by Government to address environmental issues.
- viii. government through the ministry of transport should make policy to ensure that public transport is well regulated and make attractive to commuters in order to increase ridership.

## REFERENCES

- Aigbedion, I. M., Salihu, D. S. & Omoruyi, K. I. (2015). The impact of road transportation on economic growth in Nigeria. *International journal of education and research*. 3(9) 295
- Ashiedu, C. M. (2011). An assessment of bus rapid transit system as a strategy for urban traffic management in Lagos metropolis. Unpublished B.Sc. Project, Department of Geography, University of Nigeria, Nsukka
- Aworemi, J. R., Abdul-azeez, I. A. & Olaagun, O. B. (2009). A study of the performance of public transport company in Niger State, Nigeria. *International Journal of Business and Management* 4 (11): 73-80.
- Banjo, G. A. (2008). Integrated mass transit in Nigeria's Cities: Issues, challenge and options. Paper presented at the LAMATA National Conference on Public Transportation, Lagos, Ikeja.
- Beirao, G., and J.A. Sarsfield Cabral. (2007). Understanding attitudes towards public transport and private car: A qualitative study. *Transport Policy* 14: 478-489.
- Brendan F., Amal K. & Samson G., (2011) Organizational Structure, Ownership and Dynamics on Control in the Informal Local Road Passenger Transport Sector, Centre for Urban Transportation, Ghana
- Budiono, O. A. (2009). Customer satisfaction in public bus transport: A study of travellers' perceptions in Indonesia. M. Sc Thesis: Service Science Program. Karlstad University.
- Chengming Zhu, Yanyan Chen, & Changxi (2014) "The Theory of Dynamic Public Transit Priority with Dynamic stochastic park and ride" Transportation Research Center, Beijing University of Technology, Beijing 100124.
- Dale, R. R. (1965). Review of Educational Research: An Introduction, by W. R. Borg. *British Journal of Educational Studies*, 14(1), 146–146.  
<https://doi.org/10.2307/3119062>
- Federal Highway Administration (FHWA) U.S. Department of Transportation 1200 New Jersey Avenue SE Washington, (2020). The regional concepts for transport operations. [www.ops.fhwa.dot.gov](http://www.ops.fhwa.dot.gov) Publication No.: FHWA-HOP-07-122
- Muhammed L.I. (2015). Assessment of urban bus service in Minna Niger state.



M.sc/Env-Des/6195/2011-2012

- Nurul-Habib, K.M., Kattan, L., Islaam, T., (2009). Why do the people use transit?  
A model for explanation of personal attitude towards transit service quality. In:  
Proceedings of the 88th Annual Meeting of the TRB, Washington, DC. January 11–  
15, 2009. Part 2/ Bus transit capacity. Transit capacity and quality of service manual  
(part B)
- Nwafor, E., Onya, V. (2019). Road transportation service in Nigeria: Problems and  
prospects. *Advance Journal of Entrepreneurship Development*  
<https://iiasdpub.co.uk/ajed/wp-content/uploads/>
- Raoniar, R., Rao, M. & Senathipathi, V. (2015). Public Transport Performance Evaluation  
Techniques. *A Review*. 3. 1-8.
- Voigt, Fritz & Hermann W. (1982). A general concept of transportation theory.  
*International Journal of Transport Economics / Rivista Internazionale Di Economia  
Dei Trasporti*, vol. 9, no. 1, Accademia Editoriale, 1982 (15–24),  
<http://www.jstor.org/stable/42748144>.