

Operation and Management of Tricycle (Keke Napep) as a Means of Public Transport in Minna, Nigeria

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Abstract

Tricycle (KEKE NAPEP) as a mean of public transport in Nigeria has come to stay and becoming a dominant mean for public transport in Minna, Nigeria. This paper aimed to assess the operation and management of Tricycle as a means of public transport in Minna. Two separate structured questionnaires were used to collect data on the operators and passengers perceptions on the tricycle operations. The result was subjected to a hypothetical test, using ANOVA and Chi-Square, and descriptive technique as a method of analysis. The findings reveal that a high percentage (38.2%) of KEKE NAPEP ownership is on the hire purchase agreement, and there are high maintenance expenses (67.6%). Also, possible recommendations were provided on how to curb the identified challenges, which include; ACOMORAN should mediate between her members and investors in seeking loans and conclusion of hire purchasing agreement. Furthermore, they should ensure favourable loan tenure for her members; the government should subsidise spare parts and ensure proper road maintenance so that the rates of wear and tear of vehicles part are reduced.

Keywords

KEKE NAPEP; Commuters; Passengers; Operators and Satisfaction.

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Introduction

Transportation is the engine for the socio-economic development of any nation. It caters for the mobility needs of people in cities and towns for their various human activities. As the city evolves, the demand for passenger and goods movement become more complex and challenging to

satisfy. People begin to spend longer waiting time on the roadside or terminal to catch a vehicle to their destinations, and all other purposes of travel are defeated (Dike 2012). Because of these challenges, commuters face deciding to resort to other

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modes of transport such as tricycle and motorcycles to access a quality destination.

The tricycle has been in used in Asia countries as a mean of public transportation, especially in Indonesia, Bangladesh, Thailand and Philippine (Agustin, et al. 2018). In Philippine mainly, a tricycle is composed of a motorcycle fitted with a singled wheel sidecar or a unique motorcycle with two-wheel cabs to provide mobility needs for a fee (Guillen, 2004; Gullen & Ishida, 2004). Unlike its counterpart which uses the scooter engine, particularly those in Nigeria, Japan and India.

A tricycle has various names at different localities of the world for example in Accra they are called Pragya, Qingqis in Pakistan, Rickshaw in India and Cambo in Ho (Jing et al., 2019, Starkey et al., 2019). However, the acceptance of tricycle as a means of public transport is because commuters consider its safety, security, affordability, reliability, comfort and efficiency for their transport service choice (Litman, 2020).

The tricycle is known as 'KEKE NAPEP' in Nigeria, and its introduction was as a result of the stagnant economy, high cost of acquiring new and semi-used vehicles, weak transport system, and high unemployment rate as well as the need to empower a large number of idle youths to reduce poverty level in the society (Ajiboye and Dosunmu, 2007).

'KEKE' is a word in the Yoruba language in Nigeria, meaning bicycle. The evolution and development of KEKE as a mean of public transportation in Nigeria can be traced back to Brigadier General Mohammed Buba Marwa (Rtd), the Military Governor of Lagos State between 1996 and 1999. He was the first to launch tricycle to be used as commercial transport in Lagos State and Nigeria. After the launched, the vehicles were called 'KEKE Marwa' (Mgbemena, 2013).

However, KEKE became popular across the nation due to the tricycle's adoption by the National Poverty Eradication Programme (NAPEP) programme of President Olusegun Obasanjo's administration to reduce poverty level and economically empower her citizens. Thus, KEKE NAPEP gained popularity across Nigeria (Mgbemena, 2013). Furthermore, this was also the beginning of the widespread use of KEKE as a mean of public transportation in Nigeria.

However, KEKE NAPEP as public transport started majorly in Niger State during the era of Dr Mu'azu Babangida Aliyu as Governor. He distributed about 1000 tricycles to the general public to replace the use of motorcycle that was banned and as an empowerment programme of his government to his people (Niger State Ministry of Transport, 2011). Since then Tri-cycle (KEKE NAPEP) usage has grown in leaps and bounds. It has become an essential means of intra-city transport in Niger state. However, this growth did not limit the usage and growth of commercial motorcycles operation. According to Amalgamated Commercial Motorcycle Owners and Riders Association of Nigeria (ACOMORAN, 2019), the usage of tricycle (KEKE NAPEP) in Niger State increased in numbers years and within 2017 and 2018 her registered member has risen from 3000 to 6000.

The use of tricycle has become dominating as a mean for commercial transport service in Minna. For these, there have been many challenges facing the operators and commuters. These challenges among others include high accident rates and traffic congestion, difficulty in financing the purchase of tricycle, high operation cost and meeting up with revenue generation daily by drivers, timelines, safety, the effects of the task force activities as well as the level of the experience of the operators.

Tricycle (KEKE NAPEP) operators face similar challenges in Mubi, Owerri, Aba and other cities in Nigeria (Dike, 2012. Nwaogbe, et al. 2012; Jibrilla and Fashola, 2017). Metro Manila study has revealed that tricycle operations have increased traffic congestion in the Metropolis and that traffic congestion resulted from slow driving since tricycle cannot be overtaken due to vehicle on both sides of the tricycle (Gamboa, 2003). Also, tricycle operations pose a strong challenge to safety and security and have accounted for about 12% vehicular accident in Manila (Guillen, 2004; Guillen & Ishida, 2004). For the above reasons, this study will want to assess the operation and management of tricycle (KEKE NAPEP) as a means of public transport in Minna, Nigeria.

Research Hypothesis

H01 There is no statistically significant relationship between passenger satisfaction and the KEKE NAPEP services in Minna.

H02 There is no statistically significant relationship between ownership type and the operators' daily income.

The Study Area

Minna city serves as the capital of Niger State and has two local government areas: Chanchaga and Bosso. The town has engulfed the suburbs like Barkisali, Chanchaga, Kpakungu, Maikunkele, and Matunbi and Tunga. The estimated population of Minna Metropolis was around 291,900 in 2009 and a projected population of 301,952 in 2019 using the annual growth rate of 0.85% (NPC, 2009).

As a result of Minna's proximity to Abuja, the Capital of Nigeria and the location of some higher institutions in the Metropolis like the Federal University of Technology Minna and the Collage of Education Minna and the establishment of the headquarter of the National Examination Council (NECO) as well as two major military formations has attracted population to Minna Metropolis.

Subsequently, the increased population has pushed the demand for public transport up, resulting in the Metropolis' poor transport condition. Especially in areas like Chanchaga, Kpakungu, Mobil, Obasanjo Complex, to mention a few at the significant intersection points or roundabouts. They are characterised by perennial traffic congestion which is mostly high in the morning and afternoon, especially during peak hours (Niger State Ministry of Transport, 2011).

Literature Review

Transformation Model

Production theory is defined as the economic process of producing outputs from a given input. It explains the principle by which an organisation decides how much of each commodity it sells products and how much inputs require the production of goods or service. The Open University (2011) agreed that in producing and delivering of goods or service to customers by an organisation requires three components, i.e. the input, transformation process and output as shown in Figure 1 below;

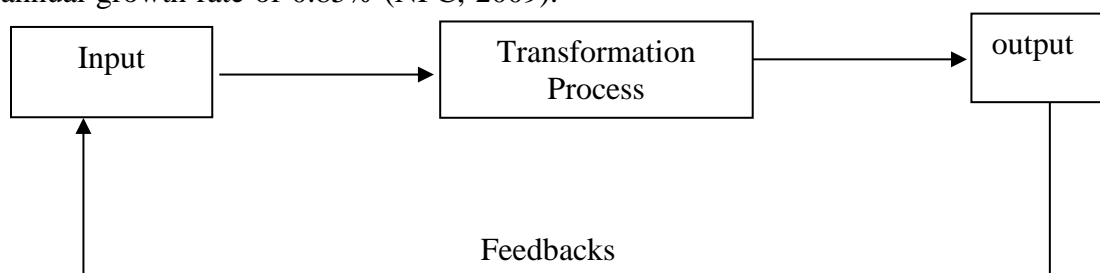


Figure 1. Showing the Production Process

Sources: Adapted from the Open University (2011)

In operating a KEKE NAPEP business requires combining the following three components shown in the figure above. However, some inputs are used to provide transport services; this includes fuel, spare parts, engine oils. Others play a part in the production process but are not used up, for example, the operating permits.

The transformation process requires translating the business requirement in a logical business model into an acclimatised model to the target environment it will be operating in (Tubber, 2011). The transformation of resources to output requires managing and monitoring material flows, information and people who are transformed somehow.

However, the output provided for KEKE NAPEP operation are mainly in personal experiences and not tangible. Furthermore, feedback is essential in the operation managers' production of service, both internal and external sources for continued service improvement. Therefore, this study adopts the transformation theory.

Concept of Operation and Management

The operation concept is a document portraying a proposed framework's qualities from the perspective of a person who will utilise that framework, for example, a business necessity particular or stakeholder's requirement specification (The MITRE Corporation 2014). It utilises the quantitative and subjective framework attributes to all partners. The term operations are broadly utilising in the military, legislative, administration and different fields.

Boddy (2012) defines management as controlling, leading, organising, and planning resources' transformation into valuable outputs to achieve the organisational business objectives. According to Nadrifar, Bandani, and Shahryari (2013), management was an undertaking task with other people and

resources. However, management can be divided into two categories, strategic management and operation management. Strategic management focuses on long-term management as operation management focuses on short-term management. Also, the business environment is nowadays more networked, so the management may also require management in networks.

Strategic Management

A strategy is a unified, comprehensive, and integrated plan that relates to the organisation's strategically merits to the surrounding environment's disputes (Aworemi and Ajiboye, 2005 and Rao, 2010). A strategy is the various means or tactics undertaken by an organisation to have a competitive edge over its competitors. It is intentional to achieve the organisational objectives by mitigating the external factors that may affect the organisation's performance in a business environment. A formulated strategy adds up the management's intent of the organisation's future.

On the other hand, Gans, and Ryal, (2017) emphasises the management's understanding of the persistent heterogeneity in an organisation performance as the central objective for a strategy. Their study on the value capture theory was based on cooperative game theory. This shows that mathematical methods can be used to indicate how a strategy will create and capture value for an organisation. The operation is a core function of every business, responsible for producing goods and providing services (Juho, 2017).

An organisation with all necessary resources to produce a product cannot have output without operation function. Transport operation focused on target which must be achieved by men's effort and resources to produce service. (Stevenson 2012) opined that operation

management involves system design and effective determination related to output design, capability preparation, inventory and supply management, location selection, process selection, production planning, quality assurance, scheduling and project management and work management.

Transport operation management aims to maximise the limited capacity (i.e. seats) to meet the travel demand. Operation management includes the taxonomic instruction and mastery of the procedures that transform resources (inputs) into finished products or services for clients and customers (outputs).

Finance/Ownership of Vehicle Operation

Transport business required finance for fixed nodes and fixed-route infrastructures project or for acquiring vehicles and financing daily operations. There is a wide variety of finance options available for transport business which depends on its objective. On the other hand, transport enterprises are micro small or medium and large scales, and their finance sources vary. Hence sources for financing transport service can take any of the following forms; private sources, public sources and external sources. Furthermore, in many cases, the transport business's financiers are the owners, especially the micro small and medium transport enterprises.

Public financing sources are primarily acquired from the government; this often comes as subsidies, user taxes, budgetary, and cross utilisation of finance (Ajiboye, 2017). Ubbels et al. (2000) justified why the government decides to fund transport infrastructure. However, even though public transport systems operate at a loss, and they obtained funds from other sources to balance their accounts while they stay in operation. This claim has been confirming by many economists among whom the following are (Black, 1995 and Gwilliam, 1999, Dosunmu et al. 2007), and they

justify that government subsidises transport service to achieve specific objectives.

According to Yuri et al. (2013), there are many different finance sources. However, it is essential to differentiate between national and international funds. Furthermore, they provided various finance sources for transport infrastructures, and that international funding plays a significant development and dynamic role. The international sources for financing transport infrastructure have procedures that can be perplexing if the inflation rate is high and conversion becomes an issue.

Ajiboye and Dosunmu (2007), identified various sources for financing small scale commercial motorcycle operators in Ago-Iwoye, Ogun State and Ajiboye (2017) in his comparative study of the sources of financing small scale commercial motorcycle operators in urban areas of Nigeria and using Ago-Iwoye and Ogbomoso as case studies. Although the sources for financing small scale transport enterprises varies from one Nigeria society to another significant similarity with the sources identified. These include; personal saving, family member contribution, daily contribution (Ajo or Esusu), cooperative society, bank loan, and Non-Government Organisations.

Operational Characteristic of Tricycle Service

Tricycle as an informal transport system has dominated other public transport means because of affordability (Nwaogbe et al., 2012) and employment provision to youths through NAPEP scheme. Some commuters prefer tricycle to taxi because of its readiness, accessibility and ability to drop off commuters at every point (Agustin, et al. (2018). According to Aikin and Akude (2015), commuters save more money using tricycle for their mobility needs while the result of the study of Jing et al. (2019) shows that commuters agreed

that service cost is relatively moderate and convenient to use the tricycle.

Safety and security of tricycle operation have become a significant concern of commuters. As a means of public transportation, the tricycle has been criticised of being unsafe, and it has been noted to be a significant cause of an accident on the major roads (Onyekakeyah, 2016). The manners in which the tricycle are manufactured, and the reckless natures of the riders undermine safety, however operating the tricycle in mixed traffic, low-speed modes like tricycle and taxis are often exposed to accidents (Nwaogbe et al., 2012, Agustin, et al. (2018). Dike (2012) carried out an empirical study on the use of tricycle as public transport modes in Nigeria cities, and the result reveals that its operation is neither safe nor affordable, however; it is comfortable and readily available.

Tricycle operations have many benefits such as job creation to youths both direct (riders) and indirect (spare part dealers, and mechanics) and sources of income. Ismail et al. (2018) in their study on tricycle operation as an alternative of urban transport in Lokoja reveals that the monetary benefit accrued to KEKE NAPEP operators ranges from \$4.26-\$8.51 monthly. Their findings were supported by the study of Raji (2012) on the appraisal of Auto Rickshaw as poverty alleviation strategies in Lagos Metropolis, Nigeria.

Methodology

This study relies mainly on using a questionnaire survey. Using Cochran (2017) formula, a total of three hundred and eighty-four questionnaires were administered through hand delivery to chosen respondent out of which 280 questionnaires were retrieved and analysed.

Minna is divided into 10 cluster neighbourhoods, and only four neighbourhoods representing 40 percent

were chosen. These are Bosso, Chanchaga, Kpakungu and Tunga. However, simple random sampling was used for administering the questionnaires in these neighbourhoods with the help of three field assistants. Two separate questionnaires were used for data collection among operators and customers. Two hundred questionnaires were distributed among Commuters, and only 90% were returned. The remaining 184 questionnaires were distributed among the operators, and only 54.4% were retrieved. With the help of two field assistants, information on the operation and management of KEKE was collected. These 384 questionnaires were arrived at after determining the sample size. These were shown below.

Minna has a population of 291,900 in 2015. With a growth rate of 0.85%, a four-year projection was made up to 2019 by the authors using the formula below. The population of Minna was 301,952 in 2019 (NPC 2015 and Authors Projection).

$$P_o = P_i \left(1 + \frac{r}{100} \right)^n,$$

Where P_o = projected population, P_i = initial population, r = annual growth rate, and n = number of years. In arriving at the samples size for the study, Cochran sample size formulae were adopted and gave a total of three hundred and eighty-four questionnaires. The formulae stated as

$$n_o = \frac{z^2 P q}{e^2},$$

Where n_o = sample size, z is the selected critical value of desired confidence level (95%=1.960), P is the estimated proportion of an attribute present in the population $q=1-P$ and e .

The information gathered was analysed through descriptive statistic of tables of percentages. Simultaneously, the inferential analysis like regression and Chi-Square analysis on Statistical Package for

Social Science (SPSS) version 21 was also adopted. However, the regression analysis was stated as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e_n,$$

Where; Y = C. Sat = Commuter Satisfaction (dependent variables), β_0 = the intercept, β_1 - β_4 = the slopes, X_1 - X_4 = predictors (independent variables) i.e. Comfortable, Reliable, Safety, Security and Schedule.

Presentation of Results

The analysis of the operators' socio-economic characteristics on the ground of marital status shows that 67% of the respondents are married, and 33% of the respondents operating KEKE NAPEP are single. This reveals that the operators are responsible people and the result gotten from the survey is supported by the study carried out by Mukhtar and Dankani (2015), tricycle as a tool of poverty alleviation in Maiduguri, Borno State. The KEKE NAPEP operation in Minna is operated and owned by Men only which may be due to the socio-religious nature of the town.

From the analysis, 27% of the respondents have primary school certificate with little understanding of English language, 22% of them possess an Ordinary level certificate, and 13% of the respondents have NCE/OND certificates. Furthermore, 8% of the respondents are graduates, and the remaining 30% of the operators are not educated in western education. The above statistics indicate that the high number of uneducated and those that did not understand the English language are a significant setback to the use of KEKE NAPEP as a mean of transportation in Minna. This is due to many of their customers' inability to communicate effectively with them. This survey is supported by the work of Jibrilla and Fashola, (2017) on the impact of commercial tricycle operation on the

income of youths in Mubi North Local Government Adamawa State, Nigeria.

On the level of income generated by the operators per day, the analysis shows that 37% of their income is between \$1.06 - \$2.13, 31% of their income is between \$2.34-\$4.26 and 28% of the income is between \$4.47-\$6.38 while the rest 4% of the operators' income is above \$6.38 daily. This variation is as a result of the interpersonal relationship of the operators, knowledge of the terrain of the town, conditions of the vehicles, time of operation, among other factors. However, the level of the operator's daily income agreed with the study of Raji (2012).

The analysis of the transport business ownership among the operators of Tricycle (KEKE NAPEP) in Minna was carried out. The study, however, revealed that 40% of the respondents personally own their vehicles. 21% of them borrowed the vehicles daily from the owner on agreed terms on monetary delivery and maintenance of the vehicle and the rest 39% indicated that they are operating the KEKE on a hire purchase agreement.

In analysing the sources of financing of transport business by the respondents, 12%, 15%, 5%, and 12% of the operators acquired the vehicle through a loan taken from financial houses, the contribution from family members and thrift collectors as well as a cooperative society. The remaining 56% of the operators said they acquired the vehicle through hire purchasing agreement. The principal methods of acquiring the vehicles by the operators put pressure on the operators to meet their daily, weekly and monthly financial obligations.

An analysis of the time of operation of KEKE NAPEP operators was carried out among the respondents. The analysis shows on a daily basis that 23%, 60%, 7% and 10% of the operators do start their operation between 6-7 am, 8-10 am, 11-12 pm and around 5 pm after the close of

office. The timing variation is based on individual operator commitment to the business and other commitments such as the school run for their children.

The study further revealed that 44% of the operators charge between \$0.06 and \$0.1 per trip as fare, 16% charges between \$0.13 and \$0.21 and 30% charges between \$0.26 and \$0.32, while the remaining 10% charges above \$0.32. The fare charged by the operators is determined based on the factors discussed below.

The factors that determine the variation in the fare charged by the operators of KEKE NAPEP in Minna as revealed by the respondents; the study shows that the following factors were observed to be significant determinants. They are the distance to be covered by the operators, the condition of roads in Minna, the weather and period of the day, personal relationship with the commuters and assessment of the customers. This revelation on service affordability in this study is supported by the work of Agustin, et al. (2018).

On the acquisition of spare parts, the study reveals that 69% of the respondents agreed that spare parts for their vehicles are expensive as they are mostly imported, considering the fluctuating foreign exchange. Furthermore, 15% of the respondent agreed that the price of the spare parts is low, and 16% of the respondent agreed that the price of the spare part is reasonable.

On the analysis of the cost of maintenance of vehicles by the operators per week, the study revealed that 32%, 19%, 28% and 21% of the respondent spent below \$1.06, between \$1.06 and \$2.13, \$2.34 and \$3.19 as well as above \$3.19 respectively on the maintenance of their vehicles per week. The variation in the amount spent on maintenance cost of vehicles is based on

the condition and age of tricycles, plying routes, knowledge of the vehicle and the experience of the drivers.

The analysis of the challenges the operators of KEKE NAPEP face in their vehicle operation in Minna was also carried out. The study reveals that 25% of the respondents observed that the poor state of the road is one of the significant challenges they face in their operation. 25% of the respondent believes that their challenge is in meeting their financial obligation to their creditors, and 8% of the respondents have a maintenance issue. The rest 42% of the respondent observes that paying multiple taxes to the Local government and union is their primary challenge.

Also, this study revealed the challenges faced by commuters using their services. From the analysis, it reveals that 22.8%, 25% and 52.2% of the respondents have languages barrier with the operators, road sharing with other motorists and over-speeding has the significant issues affecting the commuters respectively. Many operators cannot communicate effectively in the English language, and overspeeding often resulted in fatal accidents.

Test for Hypothesis I

Table 1 shows the result of the linear regression, it reveals that the predictor safety ($0.000 < 0.05$), security ($0.028 < 0.05$), reliability ($0.026 < 0.05$), and schedule ($0.01 < 0.05$) are significant. However, the predictor' Comfort' ($0.385 > 0.05$) is greater than the common alpha 0.05 value, so, therefore, it is not statistically significant. Hence, operators should work on the number of passengers they carried for a trip. The formula for the multiple regression model is stated as follows;

$$Y = -0.276 - 0.78X_1 + 0.162X_2 + 0.601X_3 + 0.233X_4 + 0.146X_5 + 0.135$$

Table 1. Showing the Anova of Customers Overall Service Satisfaction

Model	Unstandardised		Standardised		
	Coefficients		Coefficient		
	B	Std. Error	Beta	T	Sig
(Constant)	-.276	.135		-2.051	.042
Comfort	-.109	.126	-.078	-.871	.385
Reliable	.165	.073	.162	2.252	.026
Safe	.571	.067	.601	8.487	.000
Security	.445	.201	.233	2.215	.028
Schedule	.150	.057	.146	2.602	.010

Sources: Authors Survey (2019)

Table 2 indicates that the significance level of ownership type and the operator daily income are (0.032 and 0.000), which are less than the significance level of 0.05.

Therefore, the null hypothesis is rejected and that there is a statistically significant relationship between the operator's level of income and ownership.

Test for Hypothesis II

Table 2. Chi-Square Result

Ownership Type		
Daily Income		
Chi Square	6.860 ^a	25.200 ^b
Df	2	3
Asymp. Sig.	0.032	.000

Sources: Computer analysis (2019)

Discussion of Results

Table 1 above assessed the relationship between passenger satisfaction and the service provided by KEKE NAPEP operators. However, the results revealed a statistically significant relationship between passenger's satisfaction and the service provided by operators. From the table1 above, the coefficient of X1 (i.e. -0.78), X2 (0.162), X3 (0.601), X4 (0.233) and X5 (0.146) represent the beta value (i.e. β_1 - β_5). Therefore, 1% change in the beta value (i.e. β_2 - β_5) will result to 0.165%, 0.571%, 0.445% and 0.150% increase in customers' satisfaction for service reliability, safety, security and schedules respectively. Similarly, a 1% decrease in the beta value (β_1) will result

in -0.109% decrease in customers' satisfaction on the comfort derived from using KEKE NAPEP for their mobility.

This study is in line with the previous work conducted by Nwaogbe et al. (2012) and Dike, (2012) on tricycle operations in Aba and Owerri, respectively. Also, table 2 above was to determine the relationship between ownership type and daily income of the operators. However, the result indicates a statistically significant relationship between ownership type and income of the operators.

Policy Recommendations and Conclusion

Base on the findings, the following measures are recommended to improve the operation of tricycle in Minna metropolis;

- ACOMORAN should mediate between her members and investors in seeking loans and conclusion of hire purchasing agreement. Furthermore, ensure favourable loan tenure for her members.
- The governments should subsidise spare parts and ensure proper road maintenance so that the rates of wear and tear of vehicles part are reduced.
- Multiple taxes should be abolished by the unions (ACOMORAN) and the local government. Also, the tax should be charged once per day instead of charging riders as they change routes. If this is done, it will help in improving vehicle reliability.
- ACOMORAN should work in conjunction with the Niger State Vehicle Inspector Officers (VIO) in ensuring that riders conform with the operational and regulations such as anti-overloading regulation: thereby improving passengers comfort and the overall service satisfaction.
- In conclusion, the use of tricycle (KEKE NAPEP) to eradicate the poverty level has improved the socio-economic condition of Niger State residents in general. The outcome of this study concludes that customers are not too comfortable with the service offered by the operators which are in line with the works of Chona et al. (2019), Nwaogbe et al. (2012), Ismail et al. (2018), Starkey et al. (2019) and Dike (2012). However, despite the challenges the commuters face on public transportation generally in Minna, they are satisfied with the

overall service of the KEKE NAPEP compare to other alternative means.

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