

Assessing Correlates of Motorcycle Patronage in Abeokuta Metropolis, Ogun State, Nigeria

OYEWOLE Kehinde Alabukun, *AKINPELU Olusegun Peter and AKINOLA Akinbowale Olukunle

Department of Urban and Regional Planning, College of Environmental Sciences,
Bells University of Technology, Ota, Nigeria

*Corresponding author: olusegun_akinpelu@yahoo.com +2348162632253

Abstract

This paper assessed correlates of motorcycle patronage in Abeokuta Metropolis, Ogun State, Nigeria. Primary data were used for the study. Eight (8) tarmacs were systematically selected for survey in the study area. Using accidental sampling technique, all the patrons willing and ready to fill the questionnaire between the hour of 7a.m and 7pm were sampled. This gave total of 219 patrons as sample size. Data were analysed using Cross-tabulation, frequency distribution, percentage, ANOVA and Relative Importance Index (RII). The study shows that there is a statistically significant difference at $p < 0.05$ of all the socioeconomic attributes analysed except gender. Results of trip purpose revealed that 42.0% of patrons use motorcycle mostly for trip to work. Trip to leisure was the least (4.6%). The level of patronage varied significantly among the sampled tarmacs with computed ANOVA results of $F = 8.489$ and $p < 0.05$. Significant factors influencing motorcycle patronage as perceived by the patrons were *ability to evade traffic* (MPFI=3.93), *bad road* (MPFI=3.74), *door to door services* (MPFI=3.73) and *availability and accessibility* (MPFI=3.41). It can therefore be established that as long as the identified factors exist, motorcycle would continue to enjoy high patronage as a means of public transport.

Keywords: *Determinant, motorcycle, patron, satisfaction and trip purpose*

Introduction

The implication of transportation to developed and developing economies has led to large volume of empirical investigations on modes of urban transport (Muhammad, 2011). Motorcycle in particular falls among the dominant mode, especially in developing economies. Motorcycle, which is a motorized vehicle, has become one of the modes of urban mobility in developing countries (Oni, Fashina and Olagunju, 2011).

The emergence of motorcycle popularly called “Okada” as a means of public passenger transport in Nigeria is necessitated by perpetual and exponential increase in urban population, without corresponding increase in supply of public transport infrastructure. The situation is compounded by the increasing level of poverty of urban residents in Nigeria (Gbadamosi, 2006). Besides, urban residents find it convenient to move around within the city with the use of motorcycle, because of high level of traffic congestion experienced on major roads and the ability of the mode to evade traffic.

In recent time, patronage of motorcycle in Nigerian urban areas has gained high acceptability among different

socioeconomic strata of urbanities, despite its vulnerability.

Literature is replete with studies that documented risk of operating motorcycle as a mode of public transport for both operators and patrons (Oni, *et al.*, 2011; Alvi, Doherty and Lewen, 2003; Akhigbe, 2010). For instance, Oni, *et al.*, (2011) established that the use of motorcycle for moving people, goods and services from one point to another is considered to be unsafe and accident prone.

The causes of motorcycle accidents are attributed to condition and nature of the roads, traffic flow and poor visibility at night. Others are the attitude and behavior of cyclists on the roads, ignoring safety measures like speed limit, traffic sign, not wearing of crash helmets and protective clothing, alcohol and substance abuse prior to riding, carrying more than the stipulated number of passengers (Alvi, *et al.*, 2003; Akhigbe, 2010). Despite the fact that motorcycle operators and patrons are prone to accidents that could lead to disability or death, the patronage of the mode is on increase, especially in cities of developing countries.

It is on record that some of the factors that

attract patrons to motorcycle are the complementary concept of multi transport chains, cheapness of the mode and provision of door-to-door service (Rietveid, 2001). In order to regulate the motorcycle operation and the activities of the operators, it is essential to investigate empirically factors that motivate patrons to patronize motorcycle in Nigerian urban areas, particularly in Abeokuta metropolis.

Although there are studies on factors that influence patronage of motorcycle (Alvi, *et al.*, 2003; Rietveid, 2001), however, information on correlates of motorcycle patronage in Nigerian urban areas, particularly in Abeokuta metropolis are scanty in literature. Thus, there is need for a study that will scientifically document the factors in the study area. In addition, this study will establish the level of motorcycle patronage and show whether there is significant difference in the level of patronage among the surveyed tarmacs.

Literature Review

Mobility is a reflection of individual personalities and socioeconomic status (Oni, *et al.*, 2011). It has different meaning in different field of study. For instance, urban planning sees it as a spatial movement of people from one location to another, either

temporarily or permanently with adequate references to social factor resulting from push or pull factors (Basorun, 2004; Olorunfemi and Basorun, 2013). Transport modes are diverse and each offers varying degree of mobility and accessibility under different circumstance (Oni, *et al.*, 2011; World Business Sustainable Development (WBCSD), 2001). Of particular importance to this study is motorcycle. It is a motorized vehicle. Its emergence as a means of urban mobility has become a peculiar feature of most African and Asian countries (Zhang, Norton, Tang, Lo, Zhuo and Geng, 2004; National Highway Traffic Safety Administration (NHTSA), 2007).

In Africa, motorcycle is the dominant mode of transport for the poor, (World Bank, 2002). However, it is used as a form of recreation and leisure in developed countries such as United States of America (National Highway Traffic Safety Administration (NHTSA) 2007). The use of motorcycle as a mode of transport in Nigeria is necessitated by governments' inability to provide adequate conventional mode of transport (Adesanya, 1998). He further emphasized that motorcycle moves people, goods and services from one point to another under conditions considered to be unsafe and accident prone. Therefore, the increase

use of motorcycles for urban public transport service emerged to fill the gap in the demand and supply of public transport in most urban centres of Nigeria (Adesanya, 1998). Rietveid (2001) identified the factors influencing motorcycle patronage as means of public passenger transport especially in the developing countries as door-to-door service provision, high spatial penetration, saved waiting time at motor-park, encouraged environmental performance and cheap fare.

Despite the fact that commercial motorcycle received high patronage, studies have shown that the mode is prone to high rate of accidents. For instance, Nigeria Highway Code, (2008); Adisa, (2010) and Ogagaoghene, (2011) identified factor influencing the rate of commercial motorcycle accidents to include: over speeding, wrong overtaking, bad roads, mechanical defect, and alcoholic intake. Other are tyre defect, trafficator's failure/misinformation, oil spillage on the road, animal crossing, overloading, wrong maneuvering and dangerous checkpoints by the law enforcement agencies like the Nigerian police and the officers of Federal

Road Safety Commission (FRSC).

Although there are studies on motorcycle operation (Muhammad, 2011; Oni, *et al.*, 2011; Rietveid, 2001], few documented factors influencing motorcycle patronage (Olorunfemi and Basorun, 2013), however, those that specifically document determinants of motorcycle patronage in urban areas of developing countries such as Abeokuta metropolis are scanty in literature. Thus, this study is set to empirically investigate the correlates of motorcycle patronage in Abeokuta Metropolis, Ogun State, Nigeria.

Study Area and Research Methods

The study area is Abeokuta, the capital of Ogun State. It is located in South-western part of Nigeria (See Figure 1). It is located on latitude 7°9'39"N and longitude 3°20'54"E. The area is characterized by high diurnal monthly and annual temperature with low diurnal, monthly and annual temperature range. It is marks by high rainfall, high relative humidity, high potential and actual evaporation, high prevailing wind speed, high insulation and cloud cover and low atmospheric pressure (www.answer.com/Abeokuta).

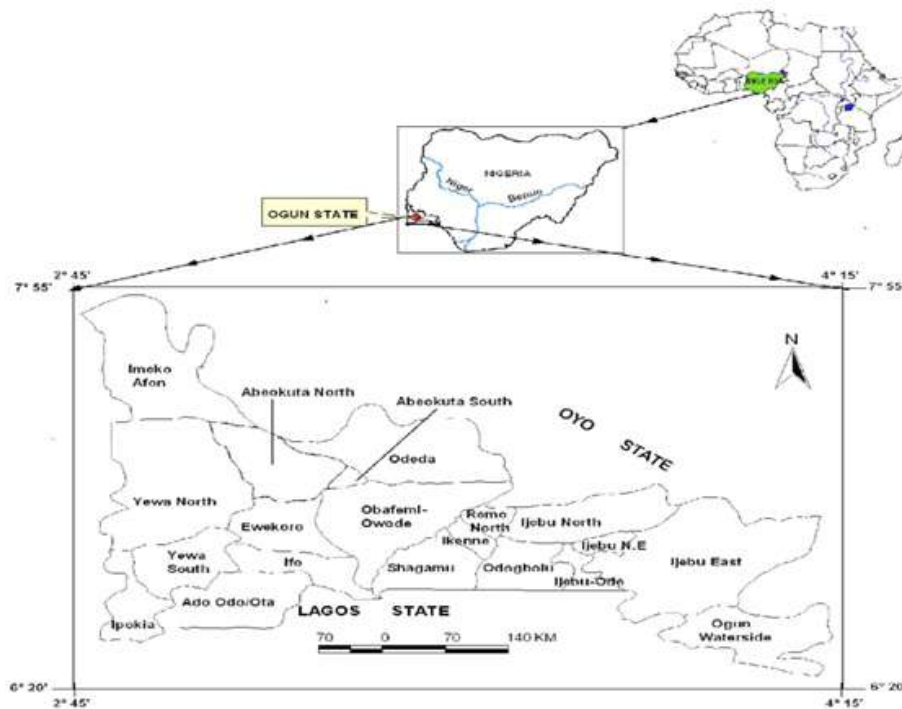


Figure 1: Ogun State in the context of Nigeria and Africa

Source: www.researchgate.net/Location-map-of-Abeokuta-and-its-environs

The geology of Ogun State consists of sedimentary rocks and basement complex rocks overlain by Maestrichtian sediments. A large proportion of Abeokuta is of sedimentary formation, while less than half is of basement complex rock of Pre-Cambrian formation.

The study adopted cross-sectional research design. This made it possible to obtain information from sample, a representative of population. This was done through questionnaire administration. Data were collected from patrons on issues regarding socioeconomic attributes such as gender,

age, marital status, educational attainment and income. Others are trip purpose, level of patronage and factors influencing patronage of motorcycle in the study area.

Abeokuta metropolis is made up of four Local Government Areas namely; Abeokuta North, Abeokuta South, Odeda and Obafemi-Owode. The largest part of Abeokuta metropolis lies in Abeokuta South Local Government Area, while other local governments form the boundary of Abeokuta metropolis. Data collection focused specifically on Abeokuta South Local Government Area, as the only local

government that is wholly within the metropolis. The total number of motorcycle parks popularly known as tarmac was thirty (30). Twenty-five percent (25%) of the tarmacs which is assumed to be large enough as representatives were systematically sampled. This gives a total of eight (8) tarmacs as sample size.

Using accidental sampling technique, passengers that patronized the tarmacs between the hour of 7a.m and 7pm; willing and ready to fill the questionnaire were sampled. The time frame was adopted because it captures pick periods in the morning and evening. Questionnaire instruments were administered on a total of 219 patrons in the selected tarmacs. This was taken as sample size for this study. Data collected were analysed with the use of cross-tabulation, frequency distribution, percentage, Analysis of Variance (ANOVA) and Relative Importance Index (RII). Cross-

tabulation, frequency distribution and percentage were used to analysed socioeconomic attributes of the patrons. However, ANOVA and RII were used to analysed relationship between the socioeconomic characteristics of residents and factors influencing patronage respectively.

Results and Discussion

Under this section, findings on socioeconomic attributes of the patrons such as gender, age, marital status, educational background, occupation and income are discussed. Also examine is the level of motorcycle patronage, trip purpose and factors influencing motorcycle patronage in the study area.

Gender of Patrons

The information on gender of the patron in Table 1 shows that 62.6% were males, while females accounted for 37.4%.

Table 1: Gender of Patron

Tarmac	Gender		Total (%)
	Male (%)	Female (%)	
Iberekodo	14 (70.0)	6 (30.0)	20 (100)
Oke-Ido	11 (55.0)	9 (45.0)	20 (100)
Panseke	15 (48.4)	16 (51.6)	31 (100)
Laderin	13 (65.0)	7 (35.0)	20 (100)
Olokuta	13 (65.0)	7 (35.0)	20 (100)
Itoku	18 (90.0)	2 (10.0)	20 (100)
Kugba	14 (66.7)	7 (33.3)	21 (100)
Elega	39 (58.2)	28 (41.8)	67 (100)
Total	137 (62.6)	82 (37.4)	219 (100)

Source: Field Survey, 2019

The finding is in tandem with the study of (Oni, *et al.*, 2011; Olorunfemi and Basorun, 2013), that male patronizes commercial motorcycle riders than their female counterparts. This might be attributed to the risk involved or the way of boarding the mode. For instance, female putting on skirt might not be willing to patronize the mode due to discomfort that climbing with skirt or wrapper could cause. Also, some female passengers may find it uncomfortable sitting

with opposite sex on motorcycle carrying two passengers.

Age of Patrons

For ease of analysis, patrons' age was categorized into four main groups. Patrons within the age group less than 18 years are considered as teenagers. Those that are between 18 and 32 years are regarded as younger adult, while those that were between 33 and 47 years are termed as young adults.

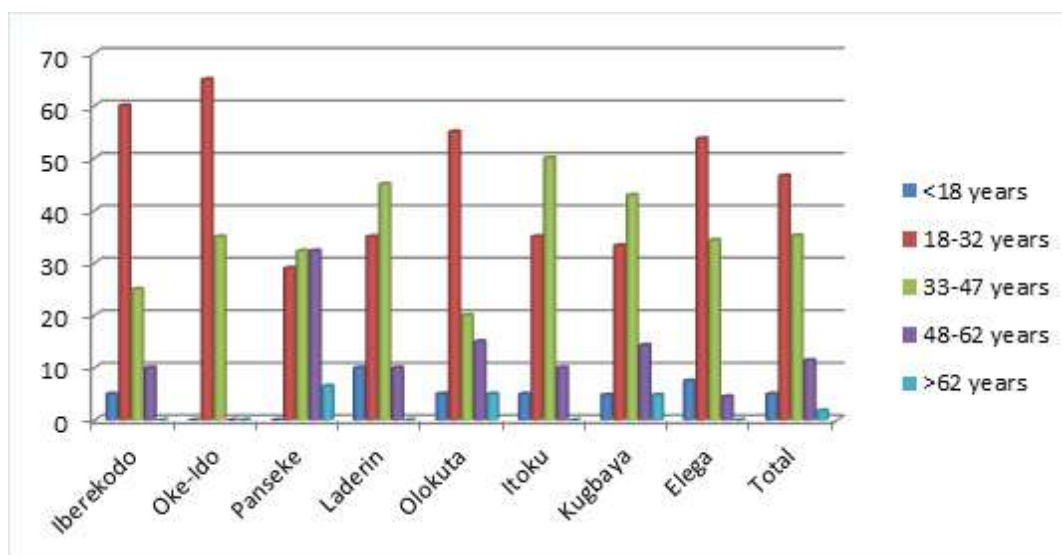


Figure 1: Age distribution of patrons
Source: Field Survey, 2019

Patrons between age bracket of 48 and 62 years are regarded as old adult. Those within the age above 62 years are regarded as aged. Generally, majority (46.6%) of the patrons were within the age bracket of 18 and 32 years (younger adult). Ranked second (35.2%) is the patrons within age group of 33

and 47 years (young adult). Patrons within the age range of 48 and 62 years constitute 11.4%, while patrons below 18 years of age had a share of 5.0%. Expectedly, the category of people that patronized motorcycle least was the over 62 years (aged). It could be inferred that adults are the

majority (93.2%) of motorcycle patrons, with younger and young adults constituting 81.8%. The computed ANOVA ($F = 3.173$ and $p < 0.05$) established that the difference observed in the age distribution of the patrons across the surveyed tarmacs is statistically significant. It could be asserted that young people are more likely to take risk, especially with the use of motorcycle as a mode of transport. In other words, it can be

inferred that the older the motorcycle patron, the less the propensity to use motorcycle as a means of transport.

Marital Status of Patrons

In aggregate, most (64.8%) of the motorcycle patrons were single. Proportion of motorcycle patrons that were married was 29.7%. The patrons that were divorced and separated accounted for 3.2% and 2.3% respectively.

Table 2: Marital Status of Patrons

Tarmac	Marital Status				Total (%)
	Single (%)	Married (%)	Divorced (%)	Separated (%)	
Iberekodo	12 (60.0)	7 (35.0)	1 (5.0)	0 (0.0)	20 (100)
Oke-Ido	12 (60.0)	8 (40.0)	0 (0.0)	0 (0.0)	20 (100)
Panseke	23 (74.2)	8 (25.8)	0 (0.0)	0 (0.0)	31 (100)
Laderin	16 (80.0)	4 (20.0)	0 (0.0)	0 (0.0)	20 (100)
Olokuta	12 (60.0)	7 (35.0)	0 (0.0)	1 (5.0)	20 (100)
Itoku	16 (80.0)	4 (20.0)	0 (0.0)	0 (0.0)	20 (100)
Kugba	17 (81.0)	4 (19.0)	0 (0.0)	0 (0.0)	21 (100)
Elega	34 (50.7)	23 (34.3)	6 (9.0)	4 (6.0)	67 (100)
Total	142 (64.8)	65 (29.7)	7 (3.2)	5 (2.3)	219 (100)

Source: Field Survey, 2019

The variation observed in the marital status of the patrons is statistically significant with ANOVA results of $F = 3.800$ and $p < 0.05$. It could therefore be posited that there is higher likelihood of single patronizing motorcycle more than married, divorced and separated in Abeokuta metropolis. This might be due to high risk involved and the propensity of young people to take risk, compared to aged and teenagers.

Educational Background

Results of Analysis of Variance (ANOVA) ($F = 7.713$ and $p < 0.05$) show that educational background of the patrons across different tarmacs varied significantly. Generally, patrons with secondary school certificate accounted for the highest (31.1%). Next in rank are the patrons with Higher National Diploma (HND) and First Degree. They constitute

26.9% of the total. Patrons with master's degree accounted for the least (3.0%). It could be inferred that academic attainment might likely influence the choice of motorcycle for mobility in the study area. Thus, it can be concluded that people with low education might find it easier to

patronize motorcycle than people with higher education. This might be attributed to higher awareness of associated hazards of using motorcycle for mobility. Figure 2 shows findings on educational attainment of the patrons.

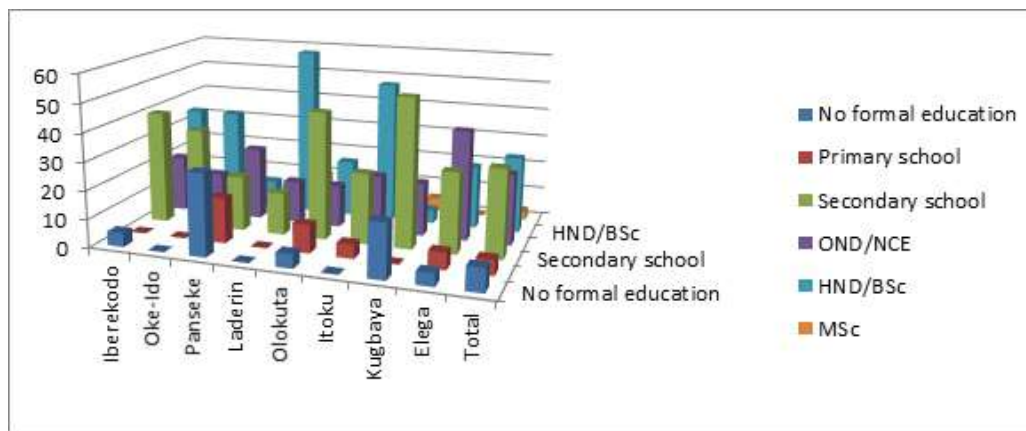


Figure 2: Educational Status of Patrons
Source: Field Survey, 2019

Occupation of Patrons

Findings from the study reveal that patrons' occupation was diverse. The results of ANOVA show that there is a significant difference in the occupation of the patrons across the surveyed tarmacs with $F = 3.786$ and $p < 0.05$. The study shows that civil servants were the majority (31.1%).

Table 3: Occupation of Patron

Tarmac	Occupation of Patron							Total (%)
	Civil servant (%)	Trader (%)	Artisan (%)	Apprentice (%)	Student (%)	Unemployed (%)	Professional (%)	
Iberekodo	11 (55.0)	4 (20.0)	2 (10.0)	0 (0.0)	2 (10.0)	0 (0.0)	1 (5.0)	20 (100)
Oke-Ido	8 (40.0)	3 (15.0)	5 (25.0)	1 (5.0)	1 (5.0)	1 (5.0)	1 (5.0)	30 (100)
Panseke	2 (6.5)	13 (41.9)	10 (32.3)	3 (9.7)	2 (6.5)	1 (3.2)	0 (0.0)	31 (100)
Laderin	12 (60.0)	3 (15.0)	0 (0.0)	1 (5.0)	0 (0.0)	2 (10.0)	2 (10.0)	20 (100)
Olokuta	4 (20.0)	3 (15.0)	0 (0.0)	5 (25.0)	1 (5.0)	6 (30.0)	1 (5.0)	20 (100)
Itoku	13 (65.0)	1 (5.0)	4 (20.0)	1 (5.0)	1 (5.0)	0 (0.0)	0 (0.0)	20 (100)
Kugba	5 (23.8)	4 (19.0)	7 (33.3)	3 (14.3)	1 (4.8)	1 (4.8)	0 (0.0)	21 (100)
Elegu	13 (19.4)	19 (28.4)	5 (7.5)	2 (3.0)	18 (26.9)	7 (10.4)	3 (4.5)	67 (100)
Total	68 (31.1)	50 (22.8)	33 (15.1)	16 (7.3)	26 (11.9)	18 (8.2)	8 (3.7)	219 (100)

Source: Field Survey, 2019

A cursory observation of the study area shows that the land use around the tarmacs greatly influenced the category of patrons. For instance, Laderin is the first civil servant estate in Nigeria, hence civil servant forming the highest patrons in that tarmac. Traders ranked second, representing 22.8% of the patrons. This might be due to presence of shopping complexes and markets. Expectedly, those that were professional constitute the least (3.7%). Most of the patrons in this category are expected to be earning better income, which could afford them opportunity of having their own car, resulting in occasional patronage of motorcycle.

Income Distribution of Patrons

Presented in Figure 3 is the analysis of average monthly income of the patrons in the study area. In aggregate, the percentage of patrons that earned less than ₦18,000 (the then, minimum wage in Nigeria) accounted for the highest. The

percentage of patrons in this category is 30.3%. Next in line are the patrons that earned between ₦18,000 and ₦32,000. This group of patrons constitutes 26.6% of the total. Patrons that earned between ₦33,000 and ₦47,000 accounted for 18.8% of the total. In order of magnitude, patrons that earned between ₦48,000 and ₦60,000; ₦61,000 and ₦77,000 and above ₦77,000 constitute 15.1%, 7.8% and 1.4% respectively.

ANOVA analysis shows that there is significant difference in the average monthly income of the patrons across the sampled tarmacs with $F = 7.314$ and $p < 0.05$. Although there is income differential among the patrons, most of them can still be regarded as low income earners, because 56.9% earned below or a little above ₦30,000 which is present minimum wage in Nigeria.

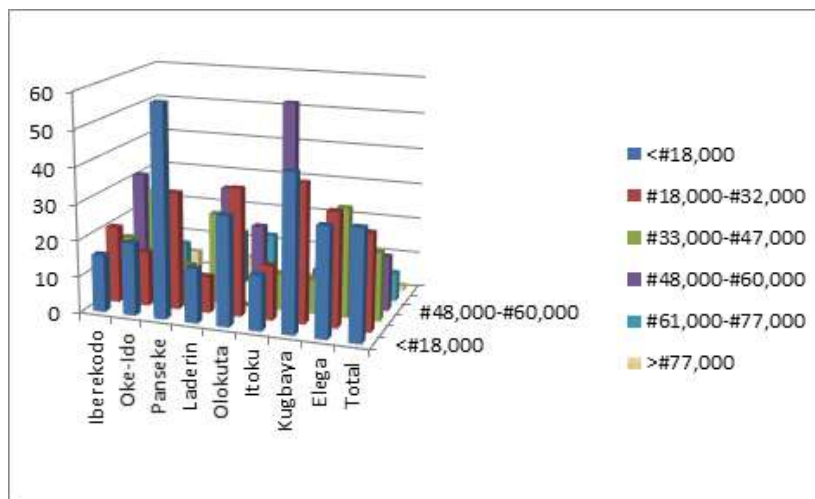


Figure 3: Income distribution of patrons
Source: Field Survey, 2019

Patrons' Trip Purpose

The results of analysis on the trip purpose of the patrons shown in Table 4, reveals that the majority (42.0%) patronized motorcycle for trip to their place of work. The proportion of patrons that engaged the use of motorcycle to the places of work was higher in Iberekodo (55.0%), Laderin (75.0%) and Itoku (90.0%). This was as a result of close proximity of the tarmacs to markets and government administrative area.

Trip to market or shop ranked second. It accounts for 32.4% of the total. Panseke tarmac had the highest percentage (64.5%) of patrons in this regard. The proportion of patrons that engaged in trip to or from

church or mosque constitutes 8.7%. The patrons in this category were mostly (25.0%) found in Olokuta tarmac. While trip to school and ceremony accounted for 6.8% and 5.5% respectively, the least type of trip purpose related to motorbike use in the study area was recorded for leisure.

The patrons in this group constitute 4.6% of the total. This is an indication that the people in Abeokuta metropolis rarely engage in recreation or leisure activities or probably leisure trips are made predominantly with other modes. It could be inferred that patrons in the study area are most likely to patronize motorcycle for trip to work place, because time is of essence.

Table 4: Patrons' Trip Purpose

Tarmac	Trip Purpose						Total (%)
	School (%)	Work place (%)	Market/Shop (%)	Church/Mosque (%)	Leisure (%)	Ceremony (%)	
Iberekodo	2 (10.0)	11 (55.0)	2 (10.0)	1 (5.0)	1 (5.0)	3 (15.0)	20 (100)
Oke-Ido	1 (5.0)	7 (35.0)	8 (40.0)	1 (5.0)	1 (5.0)	2 (10.0)	20 (100)
Panseke	2 (6.5)	7 (22.6)	20 (64.5)	1 (3.2)	1 (3.2)	0 (0.0)	31 (100)
Laderin	2 (10.0)	15 (75.0)	0 (0.0)	1 (5.0)	1 (5.0)	1 (5.0)	20 (100)
Olokuta	1 (5.0)	7 (35.0)	5 (25.0)	5 (25.0)	1 (5.0)	1 (5.0)	20 (100)
Itoku	0 (0.0)	18 (90.0)	2 (10.0)	0 (0.0)	0 (0.0)	0 (0.0)	20 (100)
Kugba	1 (4.8)	8 (38.1)	10 (47.6)	0 (0.0)	2 (9.5)	0 (0.0)	21 (100)
Elega	6 (9.0)	19 (28.4)	24 (35.8)	10 (14.9)	3 (4.5)	5 (7.5)	67 (100)
Total	15 (6.8)	92 (42.0)	71 (32.4)	19 (8.7)	10 (4.6)	12 (5.5)	219 (100)

Source: Field Survey, 2019

Level of Motorcycle Patronage

Presented in Table 5 are the findings on the level of motorcycle patronage in each of the tarmac surveyed. In aggregate, majority

(63.0%) agreed that level of patronage is high, while 37.0% perceived the patronage level to be low.

Table 5: Level of Motorcycle Patronage

Tarmac	Patronage level		Total (%)
	Low (%)	High (%)	
Iberekodo	5 (25.0)	15 (75.0)	20 (100)
Oke-Ido	7 (35.0)	13 (65.0)	20 (100)
Panseke	15 (48.4)	16 (51.6)	31 (100)
Laderin	0 (0.0)	20 (100)	20 (100)
Olokuta	17 (85.0)	3 (15.0)	20 (100)
Itoku	0 (0.0)	20 (100)	20 (100)
Kugba	7 (33.3)	14 (66.7)	21 (100)
Elega	30 (44.8)	37 (55.2)	67 (100)
Total	81 (37.0)	138 (63.0)	219 (100)

Source: Field Survey, 2019

The preponderance of high perception of motorcycle patronage attested to the fact that the mode has gained acceptability among the urban populace. However, the level of patronage varied significantly among the sampled tarmacs with computed ANOVA results of $F = 8.489$ and $p < 0.05$. The implication is that tarmacs that located close to markets, government administrative areas and industrial section attract more patrons. This can be described as locational advantage.

Factors Influencing Motorcycle Patronage

Relative Importance Index (RMI) was used in analyzing patrons' responses. Patrons' perception on factors influencing patronage were weighted on a five-point Likert scale of

very insignificant – 1, Insignificant – 2, just significant – 3, significant – 4 and very significant – 5. The number of responses for each point selected was then multiplied by the weighted score, all of which were then summed up to arrive at the sum of weighted value (SWV). The weighted value was then divided by the total number of respondents to arrive at the mean.

From the findings presented in Table 6, the Mean for the study area is 3.33. Variables with positive deviation about the Mean implies that they are very important determinants of motorcycle patronage, while those that have negative deviation around the Mean indicate that they are less important factors that influence patronage.

Table 6: Factors Influencing Motorcycle Patronage

Rank	Factors	SWV	MPFI	DM
1	Ability to evade traffic	860	3.93	0.60
2	Bad roads	819	3.74	0.41
3	Door to door service	817	3.73	0.40
4	Availability & accessibility	747	3.41	0.08
5	Comfort	716	3.27	-0.06
6	Safety	711	3.25	-0.08
7	Inadequate public transport	614	3.16	-0.17
8	Cheap fare	601	2.74	-0.59
9	Operator's human relation	598	2.73	-0.60
	Mean		3.33	

Source: Author's field survey, 2019

The highest Motorcycle Patronage Factor Index is the *ability to evade traffic* (MPFI = 3.93). Motorcycle ability to maneuver its way through traffic to ensure that patron get to their destination at the desired time is generally acknowledged as the major impetus for motorcycle patronage. The study of (Olorunfemi and Basorun, 2013) in Lokoja, Nigeria corroborates this finding. In addition, three other influencing factors with positive deviations are *bad roads, door to door service and availability and accessibility*.

Their respective MPFI are 3.74, 3.73 and 3.71. Operator's human relation was the least rated factor with MPFI of 2.73. Four other influencing factors with negative deviation about the Mean *comfort* (MPFI=3.27), *safety* (MPFI=3.25), *inadequate public transport* (MPFI=3.16) and *cheap fare* (MPFI=2.74). These factors

though they influence motorcycle patronage, but they are not as important as those with positive deviations.

Conclusion

The study has established that of all the factors subjected to patrons' rating, *ability to evade traffic* was considered as most important, while the *operator's human relation* was seen as the least.

Although, majority of the patron indicated that the level of motorcycle patronage is high, in other to reduce high patronage of motorcycle and the attendant problems such as accident, kidnapping and theft among others, governments must ensure that those factors perceived by the patrons as motivating force especially traffic congestion, bad roads and inadequate public transport should be given priority, otherwise motorcycle will continue to attract high

patronage as a means of public transport in Abeokuta metropolis and by extension in Nigerian cities with similar characteristics.

References

- Adesanya, A. (1998): *The use of motorcycle for public transport: The situation in Ibadan*. NISER Memograph Series No. 6, NISER: Ibadan.
- Adisa, R.S. (2010): A study of the use of intoxicants among rural commercial motorcyclists in Kwara State, Nigeria, *Journal of Social Sciences* 2, 85–91.
- Akhigbe, O.P. (2010): Motorcycle related maxillofacial injuries in a semi urban town in Nigeria: A four year review of cases in Irrua Specialist Teaching Hospital. *Unpublished Master's Thesis*, Umeå University, Umeå
- Alvi, A., Doherty, T. and Lewen, G. (2003): Facial fractures and concomitant injuries in trauma patients. *Laryngoscope*, 113, 102-106. <http://dx.doi.org/10.1097/00005537-200301000-00019>
- Basorun, J.O. (2004): *Basic element of urban and regional planning*. Shalom Publisher, Akure
- Gbadamosi, K.T. (2006): *The emergence of motorcycle in urban transportation in Nigeria and its implication on traffic safety*. Centre for Transport Studies. Olabisi Onabanjo University: Ago-Iwoye, Nigeria.
- Muhammad, S. (2011): An assessment of the effectiveness of tricycle as a mode of urban transportation in Kano Metropolis, Nigeria. *Unpublished Master's Thesis*, Ahmadu Bello University, Zaria
- National Highway Traffic Safety Administration (NHTSA) (2007): *Traffic safety facts 2005: Motorcycles*. NHTSA, Washington DC
- Nigeria Highway Code (2008): *The Nigeria highway codes 2nd edition*. A publication of Federal Road Safety Corps, Abuja: Detail works. 102
- Ogagaoghene, C.C. (2011): *An address delivered by the sector commander, Federal Road Safety Corps, Oyo State at the Inaguration of members of Association of Motorcycle Riders in Oyo State on 19th March, 2011*.
- Olorunfemi, S.O. and Basorun, J.O. (2013): Appraisal of regional mobility in Lokoja, Nigeria. *Journal of Society and Communication*, 7, 420-446.
- Oni, S., Fashina, O and Olagunju, Y.K. (2011): The motorcycle crash characteristics in Lagos State. *Nigeria Journal of Environmental Management and Safety*, 2, 1-15
- Rietveid, P. (2001): *Biking and walking: The position of non-motorized transport modes in transport system and traffic control*. Pergamon, United Kingdom
- World Business Sustainable Development (WBCSD) (2001): *World mobility at the end of the twentieth century and its sustainability*. Massachusetts Institute of Technology, Cambridge, Massachusetts
- World Bank (2002): *Cities on the move: A World Bank Urban Transport Strategy Review*. Washington D.C.: World Bank Publications. www.answer.com/Abeokuta
- Zhang, J.H., Norton, R., Tang, K.C., Lo, S.K., Zhuo, J.T. and Geng, W.K. (2004): Motorcycle ownership and injury in China. *Injury Control and Safety Promotion*, 11, 159-163. <http://dx.doi.org/10.1080/156609704/233/289643>