

ISSUES IN TRANSPORT PLANNING AND MANAGEMENT

Edited By:

MAHE DANGE (mni)
I. VANDU - CHIKOLO (PhD)
A. ADE OGUNSANYA (PhD; MCIT)



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AND MANAGEMENT**

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FOREWORD

This document, titled "Issues in Transportation Planning and Management" is a collection of Seminar Proceedings. It is the first in the series of educational publications to come from the Nigerian Institute of Transport Technology (NITT) and is intended to meet the challenging needs of the transport sector as they relate to transportation planning and management in the next millenium as well as meet the need for textbooks on transport and transport related subjects. It thus provides materials for academic discourse and references. It is recommended to all in the transport sector.

Major-General I.D. Gumel
Honourable Minister of Transport,
Federal Republic of Nigeria.

PREFACE

A major objective of any academic professional institution is the training and general education of people. This objective may be achieved in any of four major ways viz: through classroom teaching (as in short term or long term programmes) leading to the award of certificates; through public lectures for the dissemination of ideas; through seminars and conferences which allow for academic discourse that in the end enlightens participants; and through the publication of well thought out concepts, theories and ideas that extend the frontiers of knowledge.

The Post-Graduate Transport School of the Nigerian Institute of Transport Technology Zaria is involved in the training and education of transport professionals in the West African subregion. Over the years, the Transport School has concerned itself with the first three objectives of an academic institution. But ideas, properly nurtured and even discussed but not published suffer the possibility of poor circulation amongst people who would otherwise need such ideas. The year 1997, academically vibrant as it was, would not prove its worth if the ideas expressed through the School's fortnightly seminars were not published for public consumption and use. This informs the publication of the first in the series of the Transport School Seminar.

Titled **Issues in Transportation Planning and Management**, this publication contains only eight papers presented out of the fourteen slated for the academic year 1997. This being the first in the series, the Transport School promises even more interesting and educating papers on topical issues for publication in the subsequent years.

The Seminars during the 1997 Academic Session were made possible and very lively through the active involvement of the Director-General/Chief Executive of NITT - Alhaji Mahe Dange who was not only present at each of the Seminars but invited professionals and important dignitaries who enhanced the quality of the discussion at the Seminar. The Director of the Transport School - Dr. Chikolo was an enthusiastic host. Mr. Dada was Assistant Co-ordinator of the Seminar. All of them and other members of the Institute contributed in no small measure to ensure the success of the Seminar. This publication is dedicated to their unwavering interest in the planning and management of transport in Nigeria. If transport planners, professionals, researchers and students find the materials useful, then the objectives of this publication would have been achieved.

Prof. A.A. Ogunsanya
(Seminar Coordinator 1997 Session)
Jan. 1998

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CHAPTER EIGHT

OPERATIONS AND USE OF MOTORCYCLES AS A MODE OF PUBLIC PASSENGER TRANSPORT

By

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INTRODUCTION

The urban mobility problem has been identified as one of the most serious problems facing urban residents of the developing world today. The reason is due to the fact that the demand for transport is ever-increasing and outstripping vehicle supply considerably. Even in the advanced countries where transport is better developed, road congestion in urban area has reduced movement to what can be described as a state of relative immobility (*Ogunsanya and Galtima, 1993*).

Cities in developing countries are faced with transport problems which are manifesting in various forms, such as shortage of vehicles, bad roads, traffic congestion which are common features in Nigerian cities like Lagos, Ibadan, Enugu, Kaduna, Port Harcourt and so on. Among the problems mentioned above is the shortage of private public transport vehicles which has caused a serious crisis situation in the transport sector of Nigeria since the last one decade. This is not unconnected with the economic recession being witnessed in the country, coupled with the introduction of Structural Adjustment Programme (SAP) in 1986.

Table 1.

MOTOR VEHICLE FLEET IN NIGERIA 1984-1990

YEAR	NUMBER OF VEHICLE	%(-) OR (-)
1984	614,556	
1985	607,528	-
1986	602,120	-
1987	547,946	-0.9
1988	466,675	-8.9
1989	385,948	-14.8
1990	302,572	-17.3

Source: Tunji Bolade (1991).

Table 1 shows that there has been a decline in the motor vehicle fleet registration in Nigeria since 1985 and this trend continues till the end of the 1980s. This decline in vehicle fleet resulted into shortage of vehicle supply and the diversion of commuters to motorcycle as a mode of public transport.

Attempts to solve the urban transport problems enumerated above in Nigeria have taken different dimensions. These include the application of the various traffic Management measures in addition to the provision of transport facilities by the government. The private operators of transport have also responded to the need of solving the problems by providing taxis and minibuses among others for public transport. Available records show that more than 80% of intra-urban public transport is supplied by private transport operators (Bolade, 1988). One other area of public response to solving urban mobility problems is the introduction of motorcycles for public transport in a growing number of Nigerians cities. The use and operation of motorcycles are very prevalent in the recent times in Nigerian cities. Although the use is not completely new especially in the riverine areas of Nigeria (examples - Rivers, Cross River, etc) the wide-spread use for commercial purposes is very recent spanning the last five years.

Therefore, it is useful to examine the pattern of the growth of motor-cycles and their operation for public transport in Lagos in order to provide the vital information that may be required for planning and management of public transport.

The paper is organised into the following major parts, viz.:

- i) Introduction
- ii) Statement of Problem
- iii) Aim and Objectives

- iv) Research Methodology
- v) The Study Area
- vi) Conceptual/Theoretical Issues in Urban Public Transport
- vii) Discussion of the Findings
- viii) Implication, Recommendations and Conclusion.

STATEMENT OF RESEARCH PROBLEM

The continuing rapid urbanization trend in many developing countries and to some extent in developed nations has been accompanied by phenomenal increase in the demand for transport services and associated infrastructural facilities. Even in the affluent industrialized cities of Europe and America, high rate of increase in private car ownership has been able to dampen the increased public transport demand (Bolade, 1988). The need to meet the high rate of public transport demand requires comprehensive studies on the operation and use of various modes in our cities.

It is in the light of this, that scholars over the years have continued to carry out studies on various aspects of public transport modes: for instance, Lea Deluw-Osot's (1973) study examined the traffic situation in Lagos Island with the aim of providing short term traffic management solution. Grava (1974) also conducted, on behalf of United Nations Development programmes, a study on Lagos Metropolis aimed at providing concrete solutions to the movement problems in Lagos metropolis. Ogunsanya and Galtima (1993) discovered that increased transport demand in Yola coupled with economic recession and inadequate transport facilities to meet the needs of commuters resulted to the use of motorcycles for commercial public transport in Yola. Ojekunle (1996) in his study conducted on behalf of FUMTA discovered that motorcycles have become a popular and highly accepted mode of public transport in Lagos and that their operation is a viable business venture for the operators in the city of Lagos. Other scholars include *Oduola (1986)* *Bolade (1988)* to mention few.

However, most of the studies carried out by these scholars focused mainly on conventional transport mode in Nigeria, especially buses, taxis and other adapted vehicles such as "bolekaja" and "molue". Few of these studies focused on the operation and use of motorcycles in our cities, thus information on this mode is very scanty. This is due to the fact that the mode is relatively new, thus little or nothing is known about the nature of use and operation. Yet, we need to have a clear understanding of its growing importance in urban mobility. The growing use of motorcycles popularly known as "Okada" as a commercial public transport mode in Lagos metropolis deserves serious attention. The understanding of the underlying factors that are responsible for their use and the pattern of their

operations are very crucial in planning for this mode of transport, which hitherto has no role to play in intra-city public transport in Nigeria.

It is in the light of this that this study focuses on the operation and use of motorcycles in Agege Local Government Area of Lagos, thus providing useful information on this emerging mode of public transport.

Aim and Objectives of the Study

The aim of this study is to examine the pattern of operation of motorcycle for public transport, its patronage level, economic viability, safety level, public acceptability and otherwise of this mode of transport. The study has the following specific objectives:

- (a) to examine the evolution of motorcycles and the factors responsible for their use and operation as a public transport mode in Lagos.
- (b) to examine the mode and pattern of operation of public or commercial motorcycles in the study area;
- (c) to examine the level of patronage and public acceptability of the mode for public transport;
- (d) to identify some factors that might militate against the effective use and operation of "okada" (motorcycle) for public transport; and lastly
- (e) to offer suggestions and policy recommendations in the area of planning and management of motor-cycles for public transport in the study area.

Research Methodology

The research methodology is examined here under the following subheadings:

- i) Types of data required
- ii) Sources of data
- iii) Method of data collection
- iv) Techniques of analysis.

Types of Data Required

Three sets of data are required for this study. These include:

Users' information, operators' information and information about the evolution of the motorcycle as a mode of public transport particularly in Agege Local government area.

The users' information consists of data on socio-economic characteristics of users, reasons for using motorcycles for public transport mode, types of trips, frequency of usage, rate of accident occurrence, safety level, opinion on the

suitability of motorcycles for public transport and safety measures that can be adopted.

The operators' information also consists of data on their socio-economic characteristics, nature and pattern of operation, number of passengers carried, daily returns from operation, motorcycle ownership level amongst the operators and so on. The information needed also include reasons for engaging in the business, type of routes plied, cost of operation, problems encountered and solutions offered to the identified problems.

The third information considers the background to the emergence of motorcycles as a public transport mode in Lagos where, why and how the operation started.

Source of Data

The data required were collected principally from primary sources and were supplemented by secondary data, by reviewing the available literature and other documented materials. The primary data sources were through the use of questionnaires to elicit information from the users and operators of motorcycles. The information obtained from the questionnaires was also supplemented by direct interview of the leaders of Motorcycles Operators Union in Pen-cinema and Ogba-Ijaye areas (both in the study area).

Method of Data Collection

For the collection of the primary data, structured questionnaires were used. The users' questionnaire contains all the information already listed above under users' information while the operators' questionnaire also contains all the data listed above under operators' information. For the purpose of administering the operators' questionnaires, a preliminary survey of the study area was carried out to identify all the motorcycle parks or terminals. Out of ten (10) major motorcycle terminals identified, five of them were selected randomly for the operators interview. A motorcycle terminal is regarded as major when it has up to 20 motorcycles that use it as park. Five field assistants were posted to these selected motorcycle terminal in order to administer the questionnaires randomly to the prospective operators. Twenty (20) questionnaires were administered in each motorcycle terminal, thus making a total of one hundred (100) in all five selected terminals. The sampled terminals include Agege market, Pen-cinema, Ogba-Ijaye, Dopemu and Ade-Alu areas.

For the users' interview, a preliminary survey was carried out to identify different land uses in the area. Therefore, the study area was divided into major land use zones, such as residential, industrial, administrative, commercial and social or public land uses. Each land use type was visited and a work pace interview was conducted by using stratified random sampling method. Apart from the probability

advantage of this sampling procedure, the stratification assists in ensuring that all possible categories of users were considered (Ogunsanya and Galtima, 1993). The union interview schedules were conducted by the researcher using an interview schedule at the union office visited.

Techniques of Data Analysis

The data collected were analyzed descriptively by using tabulations and percentages to summarise them. The Pearson Product Moment Correlation technique was used to determine the relationship between types of route plied and daily revenue generated by the operators.

THE STUDY AREA

The study area is Agege Local Government Area of Lagos State. It is located in the northern part of metropolitan Lagos. The Local Government Area is bounded in the northern part by Ogun State along Alakuko area and its boundary limit in the western part is Alimosho Local Government. It has its north-east boundary at Mokuolu Street Ogba-Ijaye and its eastern boundary is found at Akran road (both in Ikeja Local Government area). The southern boundary also ends with Ikeja Local Government.

Historical Development

Agege was formally an outlying settlement within Lagos State, before it became part of Lagos metropolis as a result of expansion of Lagos. The earliest settler in Agege was a Yoruba man called Efunmikan (a son of Olofin) who came from Ile-Ife around 14th century, and settled at Orile-Agege. The major occupation of this man was tree felling (Agegi) from where the present name Agege was derived.

Agege assumed a status of Local Government headquarter in 1989 along with some other Local Government Headquarters in Lagos State. According to the 1991 population census figure, the Local Government had an estimated 650,274 people (Agege Local Government).

Economic Activities

Agege Local Government as a part of Lagos metropolis is characterised by the existence of many socio-economic activities. These include educational, trading or commercial, industrial, administrative and recreational activities. In terms of social activities, various religious and cultural activities take place especially on weekends in the area. These include burial, marriage and cultural ceremonies. Industrially, the local government has very few industries especially when compared with Ikeja and Oshodi-Isolo. However, since all these Local Government Areas are

geographically contiguous, industry-related activities are also carried out in the area especially marketing and distribution of industrial products.

One of the major economic activities that is dominant in Agege is trading. Market centres are located across the local government area. The markets include Agege market, Idi-Mangoro, Oko-Oba, Sango, Agunbiade, Dopemu, Ojokoro, Akute Orile-Oko, Araromi just to mention a few. Street trading along the major routes is a common phenomenon in the area. The area is also highly dense with residential buildings that have poor accessibility. This partly accounts for the increased use of motorcycles as public transport mode to ease mobility and accessibility problems in the area.

Some Conceptual/Theoretical Issues in Urban Public Transport

The term "urban public transport" refers to carriers of persons for hire or reward locally within an urban area (Adeniyi, 1987). World Bank (1975) has also defined it as mode of collective personal transport other than like the metros which operate on fixed routes, road-based public transport (which include buses and para-transit modes and, where there is water transport, such as ferries and boats are used). In recent years increased demand for public transport in urban centres in Nigeria has resulted in the use of non-conventional modes such as motorcycles and bicycles for urban passenger transportation.

Transportation is an inevitable engine that propels a city activities and provide functional linkages between and among various activities that are located in city's space: This is so because, people and activities in cities are spatially separated and their effective functioning demands efficient mobility. Onakomaiya (1993) revealed that studies over the years both in developed and developing countries have confirmed that a positive correlation exists between the rate of urban growth and the increase in demand for public transportation within cities (see also Aderamo, 1988 and Ayeni, 1995).

The relationship between urban growth and transport system has developed in three chronological stages: the first stage according to Onakomaiya can be described as the age of the "foot mobile". At this stage, walking was the dominant mode of urban movement. This was possible because the oldest cities were compact, densely peopled settlements whose sizes were conditioned by the convenient walking distances of the residents, while their supply hinterlands depended largely on the distances that could easily be covered by horses and wheeled carts. This era lasted till the end of the 18th century in the economically advanced countries of the world.

The beginning of the 19th century witnessed the gradual transition to the second stage, the "mass transit age". With the advancement of industrialization and rapid growth in the population of cities, longer distances became possible as the means of urban transportation improved with the development of the railways, tram-

ways and later buses. Residential, industrial and commercial suburbs proliferated around the older and bigger cities as commuting was facilitated by faster, cheaper and more comfortable modes of land transportation. This stage lasted till the second world war in Europe and America and to some extent in Nigerian cities where buses and para-transit vehicles are dominant mass transport modes.

The third stage is the age of the "Automobile" which dawned after the second world war. This stage witnessed the emergence of the automobile as the dominant urban mode of transport with concomitant influence on the rapid expansion of cities and city regions. The after-math of the automobile dominance has since necessitated new forms of adaptation and development in mass transportation within cities, particularly to cater for the needs of the increasing proportion of car-less captive commuters, the poor, the young and the old in the ever growing cities.

Taaffee, Morrill and Gould (1963) have shown on regional scale that population and economic factors are crucial in explaining the evolution of transport in Nigeria and Ghana. On a micro-level Jennelle (1969) has shown that the basic factor for the evolution of transport is the increased demand for accessibility occasioned by the introduction of transport system and its spatial effect. Jennelle's model went further to show that this demand is a cyclic one, responding to new technological development and spatial reorganisation of phenomena, which can be used to explain the evolutionary sequence of the motorcycle for public transport in Agege Lagos. This is because, the factors responsible for the development and adaptation include the increase in population of Lagos, increased spatial expansion and high level of economic specialisation. The mobility crisis situation is also worsened by the declining rate of motor-vehicle stock in Lagos in which the study area is a part.

The overall effect is a disruption of the demand and supply structure of transport services and the astronomical rise in the number of people requiring transport. In the more developed countries such as Britain and America, the increase in demand for transport according to Jennelle (1969) is a response to the form of technological development in the transport sector which leads to transport innovation. However, in a developing country like Nigeria, the response seems to be different, rather than transport technology and innovation, it is transport adaptation because of the identified serious mobility problems.

DISCUSSION OF THE FINDINGS

This section deals with the analysis of the results of socio-economic characteristics of motor-cycle users and patronage level and socio-economic characteristics of operators and their mode of operation in Lagos. Attempt is also made to examine the evolution of motor-cycles as a public transport mode and various constraints to their operations.

Socio-Economic characteristics of Motor-cycle Users and Patronage Level

In this sub-section, the relationship between socio-economic characteristics of the users and level of motor cycle patronage is examined. Out of the total of 200 respondents interviewed, 150 of them responded that they use "Okada" for public transport mode representing 75% while 50 of them said that they don't use motorcycle at all for public transport. These people constitute 25% of the people interviewed. This clearly shows that quite a substantial number of people in Lagos now use "Okada" for public passenger transport particularly in Agege area of metropolitan Lagos.

Considering the age structure, it was discovered that motorcycle patronage is high among the people of ages 21-40 years, they represent 62% of the patronage level. The least percentage of patronage is recorded by people within the ages of 51 and above. The result conforms to Ogunsanya and Galtima's study of Yola, 1993 that younger persons use "Okada" more for public transport than older people. This is due to many reasons which include low level of safety and exposure to physical elements such as rain, sun and excessive breeze.

It was also discovered that people with low educational qualification patronise motorcycle more for public transport than people with higher educational qualification. For example, people with secondary and below constitute 66.5% of the patronage. In terms of income and patronage level, it was discovered that all categories of people use "Okada" for public transport. However, the higher percentage of patronage is found among the middle income people which have 43.7% level of patronage. This is closely followed by lower income people with 41.1% patronage level. The reason for this pattern of patronage is due to the fact that the mode is not even cheaper than other public transport modes, so only those who can afford it use it.

An examination of occupation types and level of use of "Okada" among the respondents also shows some remarkable pattern. The self employed use "Okada" more than any other occupational group representing 32.3% of the patronage. The next highest percentage was recorded by the group called "Others". This group include students and unemployed with 25.3% of the total patronage. This group is followed by civil servants with 22.8% and the least record was made by private sector employees with 19.6% of the total patronage.

The marital status analysis shows that 62% of the total patronage of "Okada" in the study area was made by single men and women while 38% of the patronage was made by married people. The study also examines how frequently "Okada" is used for public transport. The result indicated that out of 158 respondents that use "Okada" for public transport, 30.4% of them use it once in a day while 34.1% use it once in a week. In addition to that, 16.5% said they use motorcycle more than once in a day. In other words, it could be concluded that 81%

of motorcycle users in Lagos patronise it at least once in a week. This shows that motorcycle is very common and has become a popular mode of public transport in Lagos.

Looking at the trip purpose, work trip records the highest number of 32.2%, this is followed by social trip by 21.5%, the least percentage is recorded by recreational purpose which constitute only 11.4%. This indicates that people prefer the use of motorcycle for transport especially when they are going to work during the peak period when traffic hold-up becomes prevalent on the city roads. The result of analysis of accident occurrence among the users of motorcycle shows generally that majority of the users, (that is, 63%) agreed that motorcycle is not safe. Out of this, 95% of them agree that "Okada" is terribly unsafe while less than 5% of them agree that it is only marginally safe. However, it must be noted here that despite the unsafe nature of "Okada", 79% of these respondents agree and support the continuation of the operation and use of "Okada" for public transport.

The users have especially turned to the use of motorcycle not for the love of it but by the circumstances surrounding the need for the mode. In the light of this, the author examines the reasons for using the mode for public transport. It was then discovered that "fastness" supercedes other reasons for use of motor-cycles. This represents 36.7% of all the respondents. This is followed by those who cherish its "ready availability" who constitute 32.3%. The least says "cheapness" which constitutes 3.8% of the persons who use motorcycle for public transport.

Evolution of Motorcycle as a Public Transport in Lagos

The use of "Okada" as a public transport in Lagos started in the year 1980 by a group of few matured adults, about 5 in number at Alakuko area in Agege Local Government Area of Lagos. These men used their motorcycles bought for personal mobility to carry passengers in the evenings after their normal day's work.

The operation started on this small scale until it spread to places like Pen-cinema, Agege Market and later to other parts of Lagos. The widespread use of "Okada" in Lagos started very recently. It became a popular mode of public transport in the year 1992 according to the union leaders of Motorcycle Operators Association interviewed. It became a popular mode of public transport due to shortage of vehicles for urban residents, mobility problem occasioned by economic recession and high inflation. Not only that, high rate of unemployment in our cities and the country as a whole is also a reason suggested for the operation of motorcycles by many urban residents.

In 1995, it was discovered that an estimate of 45,000 motorcycles were in use for public transportation in Lagos metropolis. This implies that at least 45,000 people were provided with employment directly through operation of motorcycles

in Lagos. This is very significant especially in this era of high unemployment in the country.

The operators have organised themselves into unions in different locations across the Lagos metropolis. The union leaders interviewed at Pen-cinema and Agege market claimed that their association is registered with Federal Government under the umbrella of Motorcycle Operators' Association of Nigeria. The Union or Association is very effective in regulating and controlling the conduct of their members, especially on the number of passengers that they should carry per trip, which must be one. The Unions have also divided Lagos into different zones of operation such that each zone of operation is controlled by a union and non-members are not allowed to operate.

The reason given for organising themselves into union was mainly to protect their members from regular, unlawful arrests by the law enforcement agents.

Socio-Economic Characteristics of the Operators

The analysis of marital status of the motorcycle operators shows that 51% of them were single, while 49% of them were married. Therefore, this implies that the business of motorcycle operation for public transport in Lagos is an affair of both single and married. However, the sex structure reveals that it is a male affair and no single female operator was discovered during the field work.

The age structure of the operators is also presented in table 4. below. The table reveals that 90% of the motorcycle operators are predominantly young men who took to the business due to various reasons which will be discussed in the latter part of this chapter.

Table 2: Age Structure of Motorcycle Operators

Age (in year)	No. of Respondents	%
11-20	5	5
21-30	56	56
31-40	34	34
41-50	5	5

Source: Author's Field Work, 1995.

An examination of income of the operators also reveals that 73% of the motorcycle operators in Agege Local Government earn an annual income of N10,001, to N20,000 while about 15% of them earn income of N20,001 to N30,000

per annum. It was also discovered that less than 45 of them earn income that is less than N10,001 per annum .

Generally, one can conclude that their income is relatively high when compared with the income of the workers in the public sector especially when their educational qualification are taken into consideration. Workers of the same educational qualifications with these motorcycle operators do not earn as high as income of the operators analysed.

Table 3: **Income Analysis of Motorcycle Operators**

Income (in ₦)	No. of Residents	%
0-10000	4	4
10,001-20,000	73	73
20,000-30,000	15	15
30,001-40,000	3	3
40,000-40,000	-	-
Total	100	100

Source: Author's Field Work, 1995.

Educational Background of the Operators

From table 4 below, it is apparent that 88% of the motorcycle operators have either primary or secondary education. Out of these, 59% of them have secondary school education while the remaining 29% have primary education. Only 5 respondents have N.C.E./O.N.D. qualifications, this constitutes 5% of the total respondents.

Table 4: **Educational Background of the Operators**

Education	No. of Respondents	%
No Formal Education	4	4
Primary Education	29	29
Secondary	59	59
NCE/HND	5	5
B.Sc/HND	-	-
Professional	2	2
Total	100	100

Source: Author's Field Work, 1995

However, no single respondent has degree or H.N.D. qualification, but there are 2 with professional qualifications, and this represents 2% of the total respondents interviewed.

Looking at the occupational types of the operators, majority of the operators are self-employed, while quite a sizeable number of them too are privately employed, they both constitute 64% and 20% of all the respondents interviewed respectively. The occupational status of motorcycle operators indicates other occupations that they are still engaged in or had engaged in before involvement in motor-cycle operation. Some of them said they had their own business before, but due to economic hardship they abandoned them because they were no longer viable, and therefore took to motorcycle operation. All these categories of respondents are classified under "self-employed".

Furthermore, there are some of them who were employed by private companies who were later laid off or retrenched due to economic recession. This category of people represents 20% of the respondents interviewed and they were grouped under "previously employed". These people also took to the operation of motorcycle as a means of livelihood. There are some who are young school leavers that took to "Okada" business because they could not get any other more lucrative jobs. These people are classified under "others".

Lastly, there are some of the operators who are still working but engaged also in motorcycle operation on part-time basis, majority of the people in this category are civil servants, and are also tagged as "self-employed" in the "Okada" business.

The Mode and Characteristics of Motorcycle Operation

In examining the mode of operation of motorcycles in Agege it was discovered that, about 78% of the operators were not the owners of the motorcycles they used for their daily operation. They hired these motorcycles from the owners, and only about 22% of the operators were real owners of the motorcycles they use. This figure shows that the level of ownership was due to high cost/price of purchasing a new or fairly used motorcycle which is currently estimated between N50,000 and N60,000 depending on the types, physical condition or age condition of the motorcycle in question.

Table 5: Analysis of Cost, Returns and Passenger Delivery of Motorcycle Operation

Motorcycle Parks	Ave.No. Of Passenger Per Drop	Ave. No. of daily passenger	Ave. fare charged per drop (N)	Ave. fuel cost per day (N)	Ave. daily returns (N)	Ave. daily delivery (N)	Ave. daily net returns
Pen-cinema	1	45.2	10	180	530	200	150
Agege main market	1	40.0	10	150	600	250	200
Ogba Aje	1	50.0	10	130	580	250	200
Dopemu	1	35.1	10	140	540	200	200
Ade-Alu	1	45.0	10	150	550	250	150
Total Average	1	43.1	10	150	560	230	180

Source: Author's Field Work, 1995

Table 5 above presents the analysis of general features of motorcycle operation in the study area. The table reveals that one passenger is usually carried per ride, and a sum of N10.00 is charged per drop. The table further reveals that the number of passengers carried by each operator per day ranges between 35 and 50 with an average of 43.1 passengers recorded for the whole study area.

In estimating the fuel cost per day by each motorcycle operator, an average of N150.00 is being spent on daily basis on petrol and engine oil. With respect to the average amount of money or revenue generated at the end of each day's operation, it was discovered that daily returns range from N530.00 to N600. However, the average returns calculated for the whole area is N560.00 per day (including the fuel cost).

Since it was discovered that majority of the operators hire their motorcycles, the amount delivered, to the owners of motorcycles ranged from an average N200.00 to N250.00. The net returns for the operator is estimated to average about N180.00 per day.

Assessing the Profitability Level of Motorcycle Operation

An assessment of profitability of motorcycle business is examined here. To do this, we calculate the average of both the cost and revenue for each operator on monthly basis to determine how profitable the operation of motorcycle business is in the study area. The summary of this is presented in table 6 below.

Table 6: Profitability Level of Motorcycle Operation

Ave. Monthly Cost of Repairs/Maintenance	Ave. Monthly Returns (including fuel cost)	Ave. monthly Delivery to the Owners	Ave. Monthly Returns	% Share of Owners	% Share of the Operators	Ave. monthly cost of fuel
N1,380	N14,560	N5,980	N4,680	41.07%	32.1%	N3,900

Source: Computed from Table 4.5

Table 6 above shows that an average of N14,560 is realised by each operator in a month from the operation of motorcycles. Out of this, N5,980 is delivered to the owners of motorcycle that is being hired for operation. It is further revealed from the table that N4,680.00 is estimated as average income of each operator per month. Finally, the average monthly cost of maintenance is estimated to be N1,380. While, a total of N3,900.00 is spent on fuel.

It is possible for one to conclude that the income of N4,680.00 per month is reasonably high enough for the operators especially if one considers the social status of the people involved in the business. Not only that, in the public sector a University graduate earns an income much less than this. However, looking at the percentage share of the owners, the amount delivered to the owners is as high as 41.07%. This shows that if the operators could have the opportunity of owning a motorcycle for their operation their lots could have been improved. From the foregoing, the business of motorcycle operation is highly profitable to both the hired operators and motorcycle owners who lease their motorcycles out for operation.

Pattern and Problems of Motorcycle Operation

In operating motorcycle for public transportation in Lagos especially Agege, it is discovered that the choice of route to be plied is a sole decision of each individual operator. Some operators ply only the minor and secondary routes while some ply any kind of route depending on the destination of prospective passengers who ask for their service. About 605 of the operators interviewed have no specific routes for their operation while about 40% of them limit their operation to access and secondary routes within the resident and commercial areas. 32% of the operators interviewed have less than a year experience in the business while 43% have between one year and 2 years business experience and about 25% have 2 years and above business experience.

In examining reasons for engaging in the business, over 96% of the respondents indicated that they took to motorcycle operation due to lack of job while about 4% said it was due to lack of capital to set up their own trade or business.

Analysis of problems associated with motorcycle operation in the study area reveals that numerous problems are identified as serious threat and obstacle to the smooth operation of the business. Among these problems are police harassment and unlawful arrest, council officers' harassment, motorists intimidation, vehicle inspection officers' harassment, bad roads and accidents.

Out of all these problems, police harassment top the list of all those identified as it constitutes 32%. This is followed by motorist intimidation with 27.6%. Council officers and Vehicle Inspection Officers' harassment constitute 29.1% the remaining percentage is recorded by bad road and accident problems.

In order to solve all these identified problems various solutions were proffered by the operators, these include protection from police harassment and motorist intimidation, repair of roads, enforcement of the wearing of helmet, provision of motorcycle parks by the governments and distribution of "Okada" to the operators who do not own any, at least at subsidised rate. Presently, the prices of motorcycles are too exorbitant and very few of the operators can afford one of their own.

Analysis of Relationship between Types of Routes Plied and Daily Operational Returns

The relationship between the types of routes plied by the motorcycle operators and their daily returns on each route is empirically tested. To determine this, the correlation between types of route plied and average daily returns calculated for each route plied in the study area was computed by employing Pearson Product Moment Correlation analysis.

Three types of route were identified during the field work, these are:

- a) Access routes only
- b) Secondary routes and access routes
- c) All routes (i.e. Access, Secondary and Express routes).

In order to measure these three variables, values are assigned to them nominally, this is explained below:

- Operation on access routes only = 1
 Operation on both secondary and access routes = 2
 Operation on all type of route = 3

The summary of the distribution of the two variable to be correlated (i.e. types of route and average daily returns for each route) is presented in table 7 below.

Table 7: **Distribution of Routes and Average Daily Operation Returns**

Types of Routes Plied	Average Daily Returns	Route Measurement
Access route only	330	1.0
Both access and secondary routes	400	2.0
All types (including Expressway)	500	3.0

Source: Author's Field Work, 1995.

The result of the correlation co-efficient is $r = +0.995$. This indicates that the more routes are plied by the operator the higher the revenue or returns

generated. This implies that as the operators decide to ply more routes the more revenues they would generate.

Since this relationship could have occurred by chance a 't' test statistics was computed to test the significance of the result. The calculated 't' = 19.9 and 't' table at 0.05 level with one degree of freedom gives 6.314. Since the calculated 't' is greater than expected 't' table, then the null hypothesis that there is no significance relationship between the number of routes plied and revenue generated is rejected and the alternative hypothesis that there is significant relationship between the number of routes plied and returns realised is accepted.

IMPLICATIONS, RECOMMEDATIONS AND CONCLUSIONS

There is no doubt that transportation plays a vital role in the development of any area whether at local, urban, regional, national or global level. For this purpose constant studies are required for effective monitoring and control to achieve the desired level of development in any area. It is in recognition of this that this study focussed on the analysis of operation and use of motorcycles for public transport in Agege Local Government Area of Lagos.

Implications of the Study for planning

A study of this nature has several implications for planning. The present environment in which motorcycles are being used for public transport is not safe for both the users and operators in the study area. On the other hand, the operation of motorcycles as public transport is economically viable and provide employment for the operators. Similarly, motorcycles have become a common mode of public transport in the study area and people support their operation for door to door service within the residential and commercial areas with access routes.

Policy Recommendations

In the light of the implications enumerated above the following recommendations or suggestions are made:

- i. Government should encourage the use and operation of motorcycles as a complementary mode of urban public transportation;
- ii. There is need for proper and effective inter-modal co-ordination of urban public transport to avoid inter-modal conflicts between motorcycle operators and motorists;
- iii. There should be provision of motorcycle parks in strategic places to avoid unnecessary traffic congestion created by indiscriminate parking of motorcycles in different bus-stops in the study area;

- iv. There is the need for the introduction of highway code that will consider the use of motorcycle as a public commercial transport;
- v. Introduction of safety devices such as helmet is necessary to minimise injuries being sustained by motorcycle accident victims;
- vi. The use of motorcycles as a complementary mode of public transport should be limited to access and secondary routes, i.e their routes for operation should be specified and not allowed to ply Express-ways and some other heavy traffic routes;
- vii. Adequate provision should be made in route design to take care of motorcyclists in the overall urban transport network; and
- viii. Government should assist motorcycle operators either by giving them loans to purchase their own motorcycles or provide them with motorcycles through hire purchase arrangement.

This will enhance their living standard since the major part of their operational returns are taken by the motorcycle owners.

Conclusions

The objective of this study was to examine the use and operation of motorcycles for public transport in Agege Local Government Area of Lagos through its operational pattern, patronage level, its safety level, its economic viability and public acceptability and otherwise. The findings so far indicate that motorcycles enjoy high level of patronage among young adults, low income and the people with low educational background. The business of motorcycle operation is also profitable despite the fact that many of the operators took to the business because they have no other jobs to do. However, due to the absence of safety guidelines from the governments, the mode is very unsafe and faced with numerous environmental and social problem.

Therefore, the study has suggested some measures that can be taken to make motorcycle a good complementary mode of intra-urban public transport.

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