

Intra-Urban Parking Capacities and Parking Demands in Akure (Nigeria) Urban Environment

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Abstract

The dominant means of intra-urban mobility in Nigeria is the motor vehicle whose traffic situation has deteriorated to an alarming extent in recent years. The situation is worsened when parking facilities as a major element of urban transportation development is neglected in the face of increasing activities which generate enormous parking demand. The aim of the study therefore is to examine intra-urban circulation system and its parking demand against the background of transport infrastructure on ground in Akure metropolis. A reconnaissance survey was carried out to delimit the study area into ten activity areas. The ten purposively selected activity areas were chosen based on land use activities to represent the sampling frame. Car park users and respondents working within a 20 metre radius in each activity centre were randomly selected for interview with the use of a questionnaire. The data collected were subjected to student t-test analysis to show that there is no correlation between available parking space capacities and parking space demand in Akure. The result shows that the core area of the city which is basically commercial is extensively used and as such attracts heavy traffic without corresponding parking lots. The study recommends that both state and local governments should work together to identify vacant lands for car park development.

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Background to the Study

One of the inescapable basic needs of modern societies is transport which many scholars have identified as the arteries and lifelines through which national economic systems function (Ogunbodede, 2010). This is particularly true of modern urbanized societies where great distance separate various forms of land use systems be they residential, cultural or recreational (Temidayo, 2008). In fact, one of the major dilemmas of planner is how to relate and use transportation system in the efficient ways with regards to the social structure, the needs of the people and within the available resources.

Cities are locations having a high level of accumulation and concentration of economic activities and are complex spatial structures that are supported by transport systems. According to Ogundare (2013), the most important transport problems are often related to urban areas and take place when transport systems, for a variety of reasons, cannot satisfy the numerous requirements of urban mobility. Urban productivity is therefore highly dependent on the efficiency of its transport system to move labour, consumers, and freight between multiple origins and destination. Some problems are ancient, like congestion which plagued cities such as Rome, while others are new like urban freight distribution or environmental impacts (Rodrigue, 2011).

Vehicular parking had been one of the major problems affecting cities all over the world. While structures assume high scraper in nature thereby housing many vehicle owners, the space provided for such areas are usually inadequate. In automobile dependent cities all over the world, this can be very constraining as each economic activity has to provide an amount of parking space proportional to their level of activity. Parking has therefore become a land use that greatly inflates the demand for urban land.

The most striking feature of Cities therefore is the large concentration of business activities along certain arteries in and around the central business districts. The difficulty of having a place to park vehicles in the city now constitutes a major urban transport problem. The inadequacies of parking supply are due to poor urban planning and encroachment on existing parking spaces. On the demand side, there has been a tremendous increase in the number of vehicles and this has created a high demand for parking spaces. As parking supply falls, and parking demand rises, the degree of parking deficiency is increased. The consequence of this high parking deficiency are; total blockade of roads in some cases; narrowing of available road spaces; reduced vehicle speed, increased travel time; slow to almost impossible emergency and rescue operations. It is against this background that this study examines the correlation between parking demands and parking provisions in Akure with a view to making planning recommendations for its adequacy if any.

Conceptual Framework

Spatial organization of a city defines interaction within it and the efficiency of this interaction is a function of the economy of the city and the ease with which movement is undertaken (Tanimowo and Atolagba, 2006). Different approaches have been undertaken to explain interaction within a city in terms of its spatial organisation and land use activities. Johnson (1972) identified three of such approaches or theories.

The first of such theories was propounded by Ernest Burgess (1923), known as the Concentric Theory of land use location. It assumed that development of a city follows an outward growth from its central area in a series of concentric zones and that intra-city movements primarily influence the shape of such growth. The second was the Sector Theory of Hoyt and Davis (1939), which traced the historical growth of cities along travel routes in which different parts of sectors of the city take a star-like shape as defined by route ways from the centre to the suburbs. The third was the Harris and Ullman (1945) Multi-nuclei Model, which propounded that there were multiple centres in different parts of the city, each specializing in different types of land use.

However, what appear to be common to these models are the functions or activities in a city that are determined by its economy and the interaction of people with the activities through intra-urban movement. Specifically, what this means is that there can never be a city without movement among land uses within it and that according to Etim (2007), circulation pervades every aspect of urban life.

Land use and transportation studies in Nigeria have been restricted to big cities like Lagos, Ibadan, Port Harcourt, and Kaduna, while medium cities and rapidly developing state capitals have been grossly neglected (Ogunbodede *et al*, 2008). It is in line with the above stated that using Akure as a case study was justified. Akure as a medium sized urban centre and a rapidly developing state capital therefore needs attention before it starts to experience traffic problems. It is envisaged that the increasing urban population, locational arrangements of activities and land uses coupled with the increasing functions might result in more complex traffic problems in the years ahead, since the peak hour traffic problems have already started.

Hypothesis

In an attempt to determine need for parking space in the presence of available parking spaces in Akure, the null hypothesis below was tested as part of the funding of this research:

H₀: There is no difference between the available parking space capacity and parking space demand in Akure.

The Study Area

Akure the setting for the study is a traditional Nigeria city and like other traditional Yoruba towns in the country, existed long before the advent of British Colonial rule. The city is located within Ondo State in the South-western part of Nigeria, (Fig. 1). Akure lies approximately 7° 15' North of the Equator and Longitude 5° 12' East of the Greenwich Meridian. Akure is a medium-sized urban centre and became the provincial headquarter of Ondo Province in 1939. It also became the capital city of Ondo State and a Local Government headquarter in 1976. Consequently, there was heterogeneous massing of people and activities in the city (Ogunbodede, 1999).

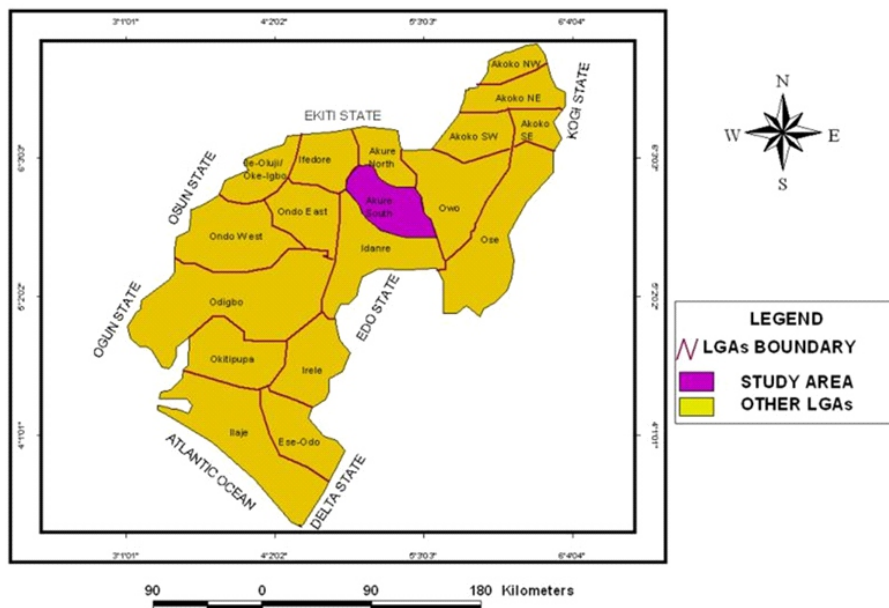


Figure I: Ondo State Showing Study Area (inset: Nigeria showing Ondo State)
Source: Ondo State Ministry of Lands and Housing, Akure (2005)

The city's morphology has changed over time to assume its present status with its attendant transport problems, as experienced in similar medium sized urban centres in Nigeria. The increased relative political influence of Akure as a state capital since 1976 has greatly promoted its rapid growth and increased socio-economic activities. The population of the city grew from 38,852 in 1952 to 71,106 in 1963. Its population was estimated to be 112,850 in 1980 (DHV, 1985); and 157,947 in 1990 (Ondo State of Nigeria, 1990). The 1991 national population census put the population of Akure at 239,124 and its estimated population in 1996 was 269,207 (NPC, 1996). However, a sharp increase was recorded in 2006 census, which put Akure south population at 353,211 and Akure north population at 131,587 respectively (NPC, 2006).

The increase in population over time and space is evident in economic activities including daily trade in commodities carried out in a network of traditional and modern markets, hotels and guest houses, dotting the landscape of both inner and outskirts of the city. These activities have subsequently increased the number of traffic and volume of travel in the city as people travel between their homes and places of work, religion, markets, hospitals, and recreational centres.

In addition, the city being strategically located in the heart of the State is linked by fairly good roads to all other local government areas which generate considerable daily road traffic flow in the central city. Space demand to park vehicles at places of destinations is therefore high with almost all the commercial and business centres located within the central city without designated parking areas. Consequently, vehicles are usually parked indiscriminately along the roads creating traffic obstruction and travel delay. Thus, parking problems have remained a major problem of the city.

Method of Study

The first step in the research methodology involved the identification of activity centres in the city. Thus, a reconnaissance survey was made in order to obtain first-hand information about the locations of parking spaces and various activity centres in the metropolis. The reconnaissance exercise guided the delimitation of the study area into ten activity areas. The ten purposively sampled activity areas were selected based on land use in the study area (see Table 1).

Table 1: Land use and Activity Areas in Akure

S/N	Land use	Activity Area
A.	Administrative	(i) Ondo State Secretariat (ii) Akure South Local Govt. Secretariat
B.	Commercial	(iii) First Bank (iv) Nepa Market (v) Oba's Market/Post Office (vi) Isikan Market
C.	Educational	(vii) Federal College of Agriculture (viii) Federal University of Technology
D.	Health	(ix) General/Specialist Hospital
E.	Recreational	(x) Owena Motels, Akure

Source: Author's Field Survey

The data for the study were obtained from primary sources through administration of questionnaires. Information needed and which were collected through the questionnaire include: the nature or type of parking, duration of parking, the need for parking, type of vehicles involved, perception of car parking in the location, as well as the extent of adequacy of parking spaces in the activity centres. Fifty copies of the questionnaire were administered to both car park users and respondents found within a 20 metre radius in each activity centre using random sampling technique. In all, a sample size of 500 copies of the questionnaires was used.

Moreover, through field survey and observation, vehicular traffic census to activity areas were carried out and measured against existing parking spaces in order to assess the level of parking convenience available per activity area. In addition, other relevant materials and data were sourced from published and unpublished official records, articles, Ministry of works and Transport and internet among others. Appropriate statistical techniques including frequency tables and percentage were used to explain the result of the study.

Presentation of Data

Respondents' Characteristic and Classification

Table 2 depicts the pattern of sex structure of the respondents as obtained from field investigation. Analysis of Table 2 shows that a high proportion of the respondents (82%) are males while the remaining 18% are females. The increase in the percentage of males over that of females can be attributed to the fact that, like elsewhere there are more male drivers than females.

Table 2: Sex of the Respondents

Sex	Frequency	Percentage (%)
Male	410	82.0
Female	90	18.0
Total	500	100.0

Source: Author's Field Survey

The information provided in Table 3 shows that majority of the respondent (64%) who are between 25 – 50 years were of the active working age. About 26% of the respondents were below 25 years of age while only 10.4% claimed to be above 50 years. This observation shows that the bulk of the respondents are youths whose age fall below fifty years, and they are mixture of young private car owners and public transport drivers. Since these set of respondents are really involved in active driving within the city, they are in the best position to give information on intra-urban transport circulation in Akure metropolis with its attendant parking situations and problems.

Table 3: Age of Respondents

Age (Years)	Number of Respondents	Percentage (%)
Below 25	128	25.6
Between 25 – 50	320	64.0
Above 50	52	10.4
Total	500	100.0

Source: Author's Field Survey

Questions relating to educational qualifications of respondents were asked for. The information revealed that about 5% of respondent had no formal education while about 14% had primary school certificate. Respondents with secondary and post-secondary education constitute more than 80% of the total respondents. The few who had primary or no formal education are mostly commercial and or cab drivers who form part of those that stop at unauthorised places to pick and drop passengers.

Educational Qualification	Frequency	Percentage (%)
No Formal Education	26	5.3
Primary Education	68	13.6
Secondary Education	131	26.2
Post-Secondary Educ.	275	55.0
Total	500	100.0

Source: Author's Field Survey

Parking Capacity and Parking Demand

Intra-urban trips in Akure indicate the form of spatial interaction of various land uses, which provide a measure of the spatial organization of the city. The travel efficiency relates to the cost of movement in terms of time value, distance, and convenience. Convenience in this study relates specifically to parking. Trip generation and attracting capacity of land use in terms of the number of vehicles and parking demand is used as a gauge to assess the functional role of each zone in terms of space efficiency. Table 5 provides data on vehicular traffic count as a measure of parking demand per activity area and the actual parking capacity in existence.

Table 5: Parking Capacity and Parking Demand in Designated Activity Centres

S/N	Activity Centre	Parking Capacity/Car	Parking Demand/Car
1.	First Bank	48	120
2.	Ondo State Secretariat	150	430
3.	Akure South LGA Secretariat	20	60
4.	Nepa Market	30	85
5.	Oja Oba/Post Office	47	250
6.	Isikan Market	60	92
7.	Federal College of Agriculture	06	21
8.	Fed. University of Technology	10	44
9.	General Hospital	52	160
10.	Owena Motels	40	45
	Total	463	1307

Source: Author's Field survey

The Table shows that parking demand in the designated activity areas of the city is indicative of high demand when compared with the existing parking spaces, and reflects the volume of vehicular traffic per hour to these activity areas. Only one of the activity areas, that is, Owena Motels have fairly adequate parking spaces. At Ondo State Secretariat and Oja Oba, parking conditions are very acute and existing demand outweighs the parking spaces. What this development implies is that vehicles in these areas are parked along the roads.

The nature of this relationship can be further expressed statistically using the t-test analysis for the hypothesis. Table 6 below shows the summary of analysis.

Table 6: The Summary of t-test Analysis

Variables	Degree of Freedom	Level of Significance	Calculated Value	Tabulated Value	Decision
Available parking capacity and parking demand in Akure	(n_a+n_b-2) = (10+10-2)	0.05 or 5%	2.143	2.100	H ₀ is rejected while H ₁ is accepted

Table 6 shows that at 18 degree of freedom and at 0.05 or 5% significant level of confidence, the computed t-test value is 2.143 and this exceeded the tabulated (critical) value of 2.100. Since the calculated t-test value is greater than the tabulated value, the null hypothesis that there is no difference between the available parking space capacities and parking demand in Akure is rejected, and the alternate hypothesis accepted. Therefore, it can be confirmed that there is difference in the available parking capacity and parking demand in Akure. Thus, the result shows that there are no enough parking spaces in the activity centres, and this has led to parking in un-authorized places. The implication therefore is that more parking spaces should be provided at the activity centres to take care of space demand for parking.

Planning Implications and Conclusion

The study has empirically established parking in Akure as a major road circulation problem. Many businesses in the area are without their own parking places and the volume of their businesses seems to be adversely affected. However, field investigation shows that vacant lands abound along the major streets of the city and they offer substantial amount of buffer zone for parking spaces.

Planning for parking facilities in the city should start with identification and inventory of vacant lands for car park development. These vacant lands can be built on the basis of either private or public ownership, and car owners can pay some fee to park their vehicles. The planning should also be comprehensive enough to include the provision of on-street parking to augment demand where the road carriage way is wide enough to accommodate one-way parallel parking. However, parking in adjacent and unauthorized spaces, which are perpendicular to street corridors should be prohibited to ensure effective patronage of the designated parking areas in the city.

All public buildings must make allowance for parking spaces before approvals are given to their building plans.

All sky scrapers in the city-centre must be encouraged to provide parking spaces in each floor. Government must also use buffer zones in the city centre to provide parking spaces for people who daily visit the area for commercial and marketing purposes.

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