

## **Public Infrastructure vs. Residential Property Rental Value in Lagos, Nigeria**

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### Abstract

Basic infrastructures have suffered major neglect over a long period of time in many Nigerian cities. Yet, the efficiency of any form of human activity largely depends on the provision of efficient infrastructure which in turn affect the demand and choice of residential property. This study examined the impact of infrastructure provision on property values in Lagos, Nigeria. Questionnaires were administered on residents across the low, medium and high residential neighbourhoods as well as registered Estate Surveyors and Valuers in Lagos State. Data was analysed by both descriptive and inferential statistical tools. The study revealed that infrastructure provision has a population magnet attracting more people to settling in a particular neighbourhood. The model summary for regression of the effect of infrastructures on property values further revealed 99.8%, 99.3% and 99.7% of the sampled variations in low, medium and high density areas respectively are attributed to the residential rental value. Fair and equal distribution of infrastructures is hence recommended to reduce discrimination on the basis of availability. Also, government should embark on site and service scheme to provide infrastructures and other amenities that will enhance property values in the less accessible areas.

**Keywords:** Infrastructure, Public, Rental value, Residential property, Lagos state

## 1. Introduction

Public infrastructure covers a wide range of services and facilities which include water, road, waste disposal, drainage, communication, primary health services, schools and housing. Adequate provision and effective management of public infrastructures according to Ajibola, Awodiran and Salu-Kosoko (2013) enhanced productive and profitable land uses in an urban area. The use of these infrastructural facilities compete less with productive uses through better rent offers. Competition for locations with good urban infrastructure usually results in an increase in land and housing sales as well as rental values (Harvey, 1993). This can be attributed to the spatial difference in the values and rents of properties in Lagos as a result of the state of infrastructure. The spatial distribution of the population as a result of the rent paid tends to reserve some parts of society for particular class of people. A proof of this can be seen in Victoria Island, Victoria Garden City (V.G.C), Lekki, Ajah, Banana Island and some parts of Ikeja compared to less endowed places like Alimosho, Agege, Ijora Badia, Ajegunle and some core areas of Ikeja such as Ipodo. Many residential neighbourhoods in the high density areas of Lagos like Ajegunle, Alimosho and the core areas of Ikeja are experiencing various forms of infrastructure deterioration. While the basic infrastructure are not provided in some of the areas from planning inception, others are either lacking maintenance thereby not meeting the required need or disliked by the residents .

Hence, the state of infrastructure is an important parameter for assessment and indicator of status of any urban system. As the efficiency of any form of human activity in an urban area largely depends on the provision of efficient infrastructure and services (Babarinde, 1998). Therefore, the significance of infrastructure in the proper functioning of an urban area cannot be under-estimated. The quality and coverage of infrastructure services have a major impact on living standards and economic growth, yet it is estimated that about two billion people lack access to adequate sanitation and

electricity while one billion lack access to clean water (United Nations, 2010). In Nigerian urban centres, basic infrastructure have suffered major neglect over a long period of time in the hands of government and its agencies that are expected to provide and maintain the infrastructure (Olujimi, 2010).

Availability of infrastructure is often one of the factors affecting the demand and choice of residential property as man is a socio-economic being seeking to dwell in residential units that provides maximum supply of necessary facilities at affordable costs. Provision of facilities that would enhance the living condition of residents within a neighbourhood is therefore very essential. Rental values of properties also vary from place to place depending on various factors among which availability of facilities stand prominent. Most often, when factors affecting rental values of residential properties are considered, the most commonly discussed factors are location, quality of building, demand and supply rate among others are the most commonly mentioned with little or no regard for the availability of public facilities and infrastructures.

All types of public infrastructures associated with urban development are available in Lagos. However, the problems of adequacy in terms of number available and condition, functionality, location, distance to homes, maintenance and management problems are very rampant and vary from one location to another. The closer a residential area, for instance, is to new infrastructural projects, the higher the increase in its values (Udoka, 2013). In addition, infrastructural development is the engine that drives the economic and technological growth in all ramifications. The provision, operation, management and maintenance of infrastructure are always big employers of labour. In the same vein, the majority of economic activities rely on them to thrive. It is against this background that the impact of public infrastructural facilities on rental values of residential properties in Lagos state is examined with a view to determining the influence of public infrastructures on rental values of residential properties in Lagos metropolis.

## 2. Literature Review

### 2.1 *Determinants of Property Values*

Real estate has no value if it has no utility, if it is not scarce and if it is not effectively demanded. Real estate has significance only if it satisfies man's needs and desires. It is this man's collective desire for property that gives rise to value (Olusegun, 2003). Thus, the ability of property to satisfy man's needs and desires together with its degree of scarcity and utility compared with others makes man to ascribe value to it. According to Millington (2005) property value is the money obtainable from a person(s) willing and able to purchase property when it is offered for sale by a willing seller, allowing for reasonable time for negotiation and with the full knowledge of the nature and uses which the property is capable of being put.

Real estate is a heterogeneous good that comprised a bundle of unique characteristics reflecting not only its location, but equally affected by other amenities such as the quality of neighbourhood and infrastructure. Ge and Du (2007) avow that property value is an essential aspect of property markets worldwide and determined by a variety of factors and the determination of those factors is a significant part of property valuation. Kamali, Hojjat & Rajabi (2008) grouped the variables determining property values into; environmental, neighbourhood, accessibility (location) and property variables.

Previous studies, including Burgess (1925), Hoyt (1939), Hendrikse (2003) have considered the effect of location on property values. Their various findings established location as a major determinant of property value. Location is important in relation to proximity to the target market and sources of supplies; conditions and facilities are important in relation to attracting optimal rentals, and security is important in relation to tenant safety. McCluskey, Deddis, Lamont & Borst (2000) measure the effect of location on residential house prices in Northern Ireland and conclude that location and structural characteristics are the key determinants of residential property values.

Additionally, Kauko (2003) lists a set of attributes that have been commonly used in property valuation research including accessibility factors, neighbourhood level

factors, specific negative externalities, public services, taxes and density factors. Tse and Love (2000) identify four categories of attributes namely; structural, physical, neighbourhood and environmental, for measuring residential property values. Wilhelmsson (2000) identifies four main factors that affect demand for properties and as well as the price, to include the property's structural attributes, its location or neighbourhood amenities, its environmental attributes and macro attributes like inflation and interest rate. However, Oyebanji (2003), confirmed a number of factors that affect property values in Nigeria. These include population change, change in fashion and taste, institutional factors (culture, religious belief, and legislation), economic factors, location, complementary uses, transportation and planning control.

## 2.2 *Urban Infrastructure and Property Values*

Different scholars have variously stressed the relevance of infrastructure in all spheres of life. Johnson, Davies and Shapiro (2005) for instance, aver that the presence of infrastructure often leads to appreciation in property values while its absence affects neighbourhood properties adversely. Hammer, Booth, and Love (2000) state that provision of good and adequate infrastructure is central to property values. Harvey (1993) opined that a residential user may be prepared to pay a high value for a property depending on his consideration for basic facilities such as accessibility, water and electricity. Litchfield (1974) observes that areas with basic facilities such as access roads, good drainage, electricity, public water supply and telephone attract high property values.

Aibangbee (1997) further explains that accessibility in terms of a good road network leads to high rental values of locations with greatest accessibility advantages. According to Ajibola, et. al (2011) where properties are accessible via good road networks, it would enjoy high rental values. Keeble (1969) also affirmed that properties in areas that are well serviced with pipe-borne water enjoy higher rental values compared to areas where the service is non-existence. Other important determinants of property values

according to Keeble (1969) include provision of good communication network, electricity and drainage. Nevertheless, in Lagos, Nigeria, Odudu (2003) observed that property values are impacted by various form of infrastructure. Similarly, Adebayo (2006) confirmed that the presence infrastructural facilities increase property values in Lagos and adversely affects it if it is absence. Unfortunately, the level of availability of infrastructure in most developing countries is drastically low, yet it is generally believed that provision of infrastructure in residential property would continue to attract prospective tenants and therefore increase property values (Ajibola, et. al, 2011).

### **3. Methodology**

The research designs applied in this study is both qualitative and quantitative. The data for this study was gotten from the residents of the 3 different residential zones (low, medium and high density) and the Estate Surveyors and Valuers in Lagos State. The sample frame for the residents of the three residential neighbourhood adopted by Oduwaye (2009) and Ministry of Lands and Housing (2014) in Lagos was adopted. 21% of the total of 224 residential neighborhoods was derived through systematic random picking from a list of neighborhoods in each of the three stratified residential neighborhoods types. From the stratified random sampling of the occupants, a sample size of 55 occupants from each of the residential neighborhood was used as adopted by Olujimi and Bello (2006) and Ogunleye (2013). The directory of the Nigerian Institution of Estate Surveyors and Valuers identifies 291 practicing estate surveying and valuation firms in Lagos state. A sample size of 159 Estate Surveying and Valuation firms was adopted using a demographic formula for determination of sample sizes by Otte (2006). Questionnaires were distributed to an occupant per building in the three neighborhoods and the Estate Surveyors and Valuers in Lagos with a view to extracting relevant information relating to the subject matter. The data collected were analyzed using descriptive statistics and inferential statistics.

#### 4. Findings and Discussions

Out of the 159 questionnaires administered to the Estate Surveyors and Valuers in Lagos, 121 (76.1%) was retrieved. 55 questionnaires each were distributed randomly to the occupants of the three (3) residential neighbourhood. 48 (87.27%) were retrieved from the occupants of the low residential neighbourhood. 49 (89.09%) were retrieved from the occupants of the medium residential neighbourhood while 51 (92.73%) were retrieved from the occupants of the high residential neighbourhood in Lagos. On a general note, 269 out of the 324 total administered questionnaires on the target population were retrieved representing 83.02%.

Table 1: Effects of Infrastructures on Property Values

Effects of Infrastructures on Property Development and Values	Opinion of Estate Surveyors and Valuers						
	S A	A	U	DS	SDA	Mean	Rank
Provision of infrastructure attracts more people to settling in a particular neighbourhood	47 (38.8)	51 (42.1)	13 (10.7)	6 (5.0)	4 (3.3)	4.08 (6)	1
Availability of infrastructures determines the rent payable in different neighbourhoods.	43 (35.5)	45 (37.2)	24 (19.8)	6 (5)	3 (2.5)	3.98 (5)	2
Development of infrastructure gives rise to the choice of site for property development	35 (28.9)	53 (43.8)	24 (19.8)	5 (4.1)	4 (3.3)	3.91 (1)	3
Provision of infrastructure generates higher property values	38 (31.4)	51 (42.1)	19 (15.7)	9 (7.4)	4 (3.3)	3.91 (1)	3
Tenants prefer properties located where infrastructural development are comparatively optimal	30 (24.8)	55 (45.5)	24 (19.8)	8 (6.6)	4 (3.3)	3.82 (2)	5



Table 1 shows that infrastructure provision has a population magnet attracting more people to a particular neighbourhood, as it ranked 1st with a mean score of 4.0826. This is closely followed by availability of infrastructures to determine the rent payable in different neighbourhoods which ranked 2nd with a mean score of 3.9835. The least considered were tenants preferring properties located where infrastructural development are comparatively optimal ranked 5th with a mean score of 3.8182.

Table 2: Model summary for regression of effect of infrastructures on property values in low, medium and high density areas

Area	R	R Square	Adjusted R Square	Std. Error of the Estimate
Low density	.999 <sup>a</sup>	.998	.997	.072
Medium density	.996 <sup>b</sup>	.993	.991	.124
High density	.998 <sup>c</sup>	.997	.996	.087

Table 2 shows the performance of the model summary of effect of infrastructures on property values in low, medium and high density areas in Lagos. The results indicate R<sup>2</sup> statistic of 0.998, 0.993 and 0.997 respectively. This implies that 99.8%, 99.3% and 99.7% of the sampled variations in effect of infrastructures on property values in the low, medium and high density areas in Lagos are attributed to the independent variables.

Table 3: ANOVA<sup>a</sup> of the effect of infrastructures on property values in low, medium and high density areas

Area	Sum of Squares	Df	Mean Square	F	Sig.
Low density	Regression	87.734	12	7.311	1399.695
	Residual	.183	35	.005	
	Total	87.917	47		
Medium density	Regression	77.977	12	6.498	422.746
	Residual	.553	36	.015	
	Total	78.531	48		
High density	Regression	92.460	12	7.705	1025.439
	Residual	.286	38	.008	
	Total	92.745	50		

From Table 3, The computed F statistic ( $F = 1399.695, 422.746$  and  $1025.439$ ) for the low, medium and high density areas of the analysis of variance fall within the rejection zone and it indicates that at least one of the model coefficient is non-zero. Hence the model is statistically significant. Hence, the model is useful in predicting the effect of infrastructures on property values in low, medium and high density areas in Lagos.

Table 4: Regression Coefficients of the effect of infrastructures on property values in low, medium and high density areas

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Model	Standardized Coefficients	T	Sig.	Standardized Coefficients	T	Sig.	Standardized Coefficients	T	Sig.
	Beta			Beta			Beta		
(Constant)	.396	1.756	.088	.873	2.526	.016	3.134	6.324	.000
Electricity	.209	4.785	.000	.479	6.873	.000	.109	2.072	.045
Water	.001	.066	.948	.034	2.106	.042	.014	.667	.509
Recreational facilities	-.032	-.967	.340	-.019	-1.028	.311	.010	.850	.401
Waste disposal	-.051	-2.464	.019	.144	2.677	.011	.015	1.212	.233
Security	.041	1.995	.054	-.025	-1.446	.157	.009	.609	.546
Hospital	-.034	-1.767	.086	-.193	-3.695	.001	-.152	-2.332	.025
Schools	-.005	-.418	.678	.034	1.402	.170	-.386	-5.014	.000
Road network	.032	2.075	.045	-.149	-3.529	.001	-.019	-1.326	.193
Street Light	.490	9.060	.000	.021	1.242	.222	-.013	-1.172	.249
Drainage	-.005	-.572	.571	.001	.065	.949	.007	.632	.531
Parking space	.044	1.471	.150	.007	.306	.762	.011	.712	.481
Building Type	.209	2.526	.016	.361	5.735*	.000	.343	4.257	.000

Table 4, shows that out of twelve explanatory variables used provision of electricity (.000), waste disposal (.019), road network (.045), street light (.000) and building type (.005) were found to significantly affect property value in the low density area. The table further showed provision of electricity (.000), water (0.042), waste disposal (.011), hospital (0.001), road network (.001) and building type (.000) as the significant public infrastructure variables in the medium density area. However, provision of electricity (.045), hospital (0.025), schools (.000) and building type (.000) were absolutely significant in the high density area. On the whole, electricity and building type were the prevalent significant public infrastructure variables impacting property value across the density zones. The t and Sig (p) values give a rough indication of the impact of each independent variable. For instance a big absolute t value and small p value suggests that a dependent variable has a large impact on rental value. The association of some of the public infrastructure as a significant influence on house rental value corroborates earlier findings of Adebayo (2006). The model specification for the impact of public infrastructure on residential rental values in the residential zones is as shown in Table 5:

Table 5: Model Specification

Density Area	Model Specification
<b>Low</b>	Rental value (Y) = 0.396+ 0.209X <sub>1</sub> + 0.001X <sub>2</sub> - .032X <sub>3</sub> - 0.051 X <sub>4</sub> + 0.041X <sub>5</sub> - 0.034X <sub>6</sub> - 0.005X <sub>7</sub> + 0.032X <sub>8</sub> +0.490X <sub>9</sub> - 0.005X <sub>10</sub> + 0.044 X <sub>11</sub> + 0.164 X <sub>12</sub>
<b>Medium</b>	Rental value (Y) = 0.873+ 0.479X <sub>1</sub> + 0.034X <sub>2</sub> - .0019X <sub>3</sub> + 0.144 X <sub>4</sub> - 0.025X <sub>5</sub> - 0.193X <sub>6</sub> + 0.034X <sub>7</sub> - 0.149X <sub>8</sub> +0.021X <sub>9</sub> + 0.001X <sub>10</sub> + 0.007 X <sub>11</sub> + 0.361 X <sub>12</sub>
<b>High</b>	Rental value (Y) = 3.134+ 0.109X <sub>1</sub> + 0.014X <sub>2</sub> + .010X <sub>3</sub> + 0.015 X <sub>4</sub> + 0.009X <sub>5</sub> - 0.152X <sub>6</sub> - 0.386X <sub>7</sub> - 0.019X <sub>8</sub> -0.013X <sub>9</sub> + 0.007X <sub>10</sub> + 0.011 X <sub>11</sub> + 0.343 X <sub>12</sub>

## 5. Conclusion

This study examines the effect of infrastructures on residential property values in the selected neighbourhoods of Lagos, Nigeria. The paper was able to establish that the relationships that exist among the infrastructures in residential properties are significant in the determination of rental value in Lagos state. The result of the research revealed that provision of electricity, waste disposal, road network, street light, building type water, hospital and schools were the most prominent infrastructures determining rental values in the three residential neighbourhoods. Also, over 90 percent of the decisions for the determination of rental value of residential properties in Lagos are based on available infrastructure facilities.

Based on the above findings, the following recommendations are put forward:

- i. The study recommends that facilities within the neighbourhoods need to be upgraded and adequately managed to further enhance the living conditions of the residents.
- ii. It is recommended that the government should embark on “site and service” scheme to provide such infrastructures as accessible roads, electricity, pipe borne water, telecommunication and other amenities that will enhance property values in the less accessible areas.
- iii. To reduce value discrimination on the basis of availability of infrastructures; infrastructures should be fairly provided and evenly distributed all over the city.

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