

## Effect of Availability of Public Infrastructure on Residential Real Estate Development in Enugu (2011-2020)

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### Abstract

Infrastructure development is critical for the smooth operation of a modern, industrialized nation. The aim of this research is to assess the effect of availability of public infrastructure on the real estate development in Golf Estate, GRA, New Haven, Trans-Ekulu, Emene and Abakpa of Enugu metropolis within (2011 - 2020) with the view to determining how these infrastructure affect the development of residential properties. The objective of this research are:- To identify the infrastructural facilities that affect Housing development in Golf Estate, Old GRA, New Haven, Trans-Ekulu, Emene and Abakpa in Enugu. The Population of the study comprise of the 50 active Estate Surveying and Valuation firms in Enugu which is also taken as the sample size as they are few. Data were collected and analysed using descriptive statistics, Analysis of Variance (ANOVA) and T-test tools. To identify the infrastructural facilities that affect Housing development in the selected areas in Enugu State. This is evidenced by the variation in Level of the Effect of Infrastructural Facilities on Capital Values of Housing Development in the selected areas of Enugu with New Haven having the highest effect and Trans-Ekulu having the lowest. It is therefore recommended that:- Prospective Landlords and Real Estate developers of various kinds of residential properties should first consult professional Estate Surveyors and Valuers about the different residential property types before taking a decision on the one to choose and should give the clients (Property owners/investors) the advice not to always wait for government to provide all the infrastructural facilities needed in their property locations.

**Keywords:** Effect, Public infrastructure, Residential Properties, Real Estate, Enugu.

### 1.0 Introduction

The need for the development of infrastructure in any region cannot be overemphasized. This is because infrastructure is the gateway to economic, social and almost unmistakably wholesome political development. Notwithstanding, however, the development of infrastructure is costly. For the same period in 2011, the amount stood at US \$4.435 billion. Ever since, there has been an upward trend. Project funding in 2010 increased significantly from 2009, reaching \$21.7 billion, up from \$18.9 billion. The scenario justifies the obvious need for the development of infrastructure in the region (Okorafor, Okoronkwo & Oladejo 2017). According to the United Nations Environment Program (UNEP) and UN-Habitat, Africa is urbanizing at a rapid rate with urban centres growing faster than anywhere else in the world. African cities will grow by 25% by 2025 and 60% of the continent's population will be urbanized by 2050. It is clear from surveys conducted (Dealogic 2010, Okoronkwo & Ezech 2012, Africa Investor 2011) that an enormous amount of people are moving out from rural areas into urban areas thus putting not only a necessity but also a demand for the provision of infrastructure between nodes as well as in the cities and ultimately the regions. Majority of poor people in the world live in rural areas where the level of public infrastructure especially roads is low. The inadequate roads and poor road access put high cost of transportation; reduce ability to use and access high quality inputs; limit the uses of local markets to the sales of their products, the purchase of consumer goods and opportunities for off-farm employment. Poor road access has put needless constraints for rural poor people in terms of access to other social

infrastructure such as education and health facilities. Therefore, improvement of rural infrastructure seems to be a clear means by which large numbers of people might acquire the opportunity to participate in the market economy and thereby raise themselves out of poverty (Oraboune, 2008). Infrastructure is a key element of poverty alleviation. Its impact is felt both on the economic and social sectors. Without roads, the poor are not able to sell their output on the market. Without electricity, the industrialization process, which provides the poor and important source of employment, is unlikely to take off. Without potable water and sanitation, health is at risk. The social and economic impact often go hand in hand (Pouliquen, 2000).

## **2.0 Literature Review**

### **2.1 Concept of Infrastructure**

According to Boylen, 2021 Infrastructure is the general term for the basic physical systems of a business, region, or nation. Examples of infrastructure include transportation systems, communication networks, sewage, water, and electric systems. These systems tend to be capital intensive and high-cost investments, and are vital to a country's economic development and prosperity. Applicable to large- and small-scale organizational frameworks, infrastructure can include a variety of systems and structures as long as there are physical components required. For example, the electrical grid across a city, state or country is infrastructure based on the equipment involved and the intent to provide a service to the areas it supports. The services generated as a result of an adequate infrastructure base will translate to an increase in aggregate output such as increased agriculture output of farmers through improved roads, creation of a sea ports, Rail links, electrical generation, transmission and distribution, water and irrigation projects,- increase quality of life and urbanization of different areas (Akinyosoye, 2010).

### **2.2 Types of Infrastructures**

According to Boylen, 2021 infrastructure can be put into several different types including:

#### **i. Soft Infrastructure**

These types of infrastructure make up institutions that help maintain the economy. These usually require human capital and help deliver certain services to the population. Examples include the healthcare system, financial institutions, governmental systems, law enforcement, and education systems.

#### **ii. Hard Infrastructure**

These make up the physical systems that make it necessary to run a modern, industrialized nation. Examples include roads, highways, bridges, as well as the capital/assets needed to make them operational (transit buses, vehicles, oil rigs/refineries).

#### **iii. Critical Infrastructure**

These are assets defined by a government as being essential to the functioning of a society and economy, such as facilities for shelter and heating, telecommunication, public health, agriculture, etc. In the United States, there are agencies responsible for these critical infrastructure, such as Homeland Security (for the government and emergency services), the Department of Energy, and the Department of Transportation.

#### **iv. IT Infrastructure**

Many technical systems are often referred to as infrastructure, such as networking equipment and servers, due to the critical function they provide within specific business environments. Without the information technology (IT) infrastructure, many businesses struggle to share and move data in a way that promotes efficiency within the workplace.

### **2.3 Eight (8) Types of Infrastructure Construction Projects**

Infrastructure projects are responsible for keeping electricity and water flowing to homes and businesses. They are also responsible for the roads, bridges and other mass transit ways used to deliver people and goods across the nation. According to Novotny (2018) these are the various types of infrastructure construction projects across the nation.

**a) Highways, Streets, and Roads**

Highways, streets, and roads are common types of infrastructure construction projects. While more often than not streets and roads are repair projects, they are no less complex logistically than other infrastructure projects. As a result repair projects can incorporate street resurfacing. It is less expensive than street reconstruction; however, it is a temporary fix. But street reconstruction is an infrastructure construction project that provides long-term fixes to an already existing road, and sometimes is the only way to repair it.

**b) Bridges**

Bridges are an important part of infrastructure construction projects. 4% of highway bridges considered to carry significant traffic are considered structurally deficient. However, structurally deficient does not mean unsafe. Project managers might find the logistics and expenses more complicated with heavily trafficked bridges infrastructure maintenance and repair projects.

**c) Power Generation and Transmission**

Infrastructure construction projects include power generation and transmission. These projects can include the construction of the power generation plant. It also will include the facilities and structures necessary to store the power and transmit power. Since these facilities are incredibly important to the infrastructure of the country, their construction is important.

**d) Mass Transit, Airports, and Airways**

One area of infrastructure construction projects that is growing is airport refitting. Many of the nation's largest infrastructure construction projects are airport reconstruction and retrofitting. The overhauling of our nation's air travel and mass transit systems are the much-needed infrastructure construction projects. These projects often require not only the laying or relaying of utilities and services but also of runways.

**e) Water Supply and Resources**

Water supply and water resources are incredibly crucial to life. They are also one of the types of infrastructure construction projects. Depending on the state you live in and what the local laws are, many of the water infrastructure projects are on updating water distribution services and improving drought resistance. The refitting of these facilities ensures accurate and effective water transport and reduces the number of leaks.

**f) Waste Management and Waste Water Management**

Waste management and wastewater management is one of the more important types of infrastructure construction projects. It is what keeps citizens safe. The safe transportation of waste from residential and commercial areas keeps our cities clean. Waste products can include trash, recycling, and wastewater.

**g) Telecommunications**

Telecommunications is what allows the world to be as interconnected as it is. As a result, the infrastructure construction projects surrounding telecommunication are essential. There are areas in the United States that have limited access to various telecommunication services, while other areas have congested telecommunication services. These areas benefit from infrastructure construction projects that help ease the pathways that connect our world.

#### **h) Hazardous Waste Removal and Storage**

Hazardous waste removal is the last type of infrastructure construction projects on the list. These infrastructure construction projects are responsible for ensuring that harmful materials like nuclear materials are safely stored. The safe construction of these sites is crucial to maintaining a healthy populous. Infrastructure contractors that specialize in hazard construction understand the gravity of their projects.

#### **2.4 Factors Affecting the Provision of Adequate Infrastructure**

Many factors are responsible for the state of inadequate infrastructure provision in Nigeria such as but not limited to: poor funding; poor governance; corruption; economic sabotage; poor maintenance culture; population explosion; and neglect of urban and regional planning laws Olaseni & Alade, 2012. Funding as one of the factor amongst the most significance factors to inadequate infrastructure provision has become a major challenge to infrastructural and other projects development in Nigeria for decades (Ihuah & Benebo, 2014; Alokun, 2008; Ayodele & Alabi, 2011). Another serious factor is the continuous Nigeria's population's increase, which at the moment stood at about 160 million and growing at the rate of 3.2% per annum Ebie, 2012. The physical and social infrastructure are required to be provided so as to support this huge population and their properties from decaying. Ebie went further to say that the increasing population growth, which is more than 50% urban is placing undue pressures on the existing infrastructure provided, as well as on government's budgets over the years. Apart from poor funding, another significant factor is the poor system of governance in the country, and which is largely responsible for the poor state of infrastructure provision in all sectors of the economy. For instance, Nigeria's fiscal revenues relative to GDP for 2013 have decreased from an estimated 25% to 14%. This low GDP growth of 11% is assumed to be largely on the inefficient allocation and poor management of the country's human and natural resources (Business Day May, 4, 2014). Olaseni & Alade 2012 while emphasising went further to affirm that embezzlement of funds allocated for infrastructural development is a common feature in public offices. Also, many projects for which funds have been allocated and released were never completed while inflation of project costs is a common experience Yunusa, 2011. Other factors to inadequate infrastructure provision are economic sabotage, lack of strong relevant policy support and poor maintenance culture practice in Nigeria and these factors has been acknowledged in the works of Ayodele & Alabi, (2011).

#### **2.5 Definition of Residential Property**

According to Odumodu, 2009 residential properties are those properties which have been specifically designed and constructed to satisfy the basic shelter need of man. Residential buildings may be rented or owner-occupied. It can be owned by private, individuals, government or corporate organizations.

The dictionaries of the Estate Surveyor and Valuers (2010) defines residential property to mean a rental or improved parcel of land or land that is devoted for use as an abode e.g. Single family home or multifamily home. In other words, residential properties are used as dwelling and include those developed flats as distinguished from commercial or industrial properties.

##### **2.5.1. Types of Residential Properties**

Balchin, 1998 there are different types of residential properties which wholly or substantially provides accommodation for people. The following are the types of residential properties in Nigeria.

- i. Duplex:** Its name from Latin word *duplo* meaning twin homes and is usually referred to as a building comprising of two attached units on two distinct properties. Wikipedia 2013 defines duplex as a dwelling having apartments with separate entrances for two families. This includes two-storey houses having a complete apartment on each floor and also side-by-side apartments on single lots that share a common wall.
- ii. Block of Flats:** An apartment (in US English) or flat (in British English) is a large building that is divided into apartments. A flat is a suite of rooms one floor forming a complete residence. It is

usually self-contained with separate kitchen, toilet and bathroom. It also comprises of a living or sitting room and a number of bedrooms together with the separate conveniences mentioned above.

- iii. **Tenement Buildings:** These are buildings designed such that each consists of double row of rooms separated by a corridor or passage. It is usually with mud and Sand-Crete block. It is popularly known as face me-face you among Nigerians. Each room usually measures an average of about 12ft × 10ft (3.66m × 3.05m) and the larger room is called parlour. They are usually let on a room by room or room and parlour basis and the occupants share common entrance to the building as well as common facilities like kitchen, toilet and bathroom. These types of buildings are not common in Government Residential Areas, Estates and prime areas such Zoo Estate, Golf Estate, Fidelity Estate, Elim Estate, Vivan Estate, Lomalinda Estate in Enugu State.
- iv. **Terrace Building:** A terrace is row of building erected on a raised ground or on a sloping site with similar physical characteristics.
- v. **Bungalow:** A bungalow has pronounced offers similar accommodation as that of a flat, but provides self-contained and complete residence on one floor with all the essential conveniences like bathroom, toilet, kitchen and possibly a store. It is however, different from a block of flats due to its low occupation density than that of blocks of flats. Where a bungalow comprises of several units of accommodation, it is called a terraced bungalow.
- vi. **Maisonette:** Is a type of residential property which offers self-contained and complete residence on two floors. The ground floor usually consists of the lounge, dining, kitchen, toilets and sometimes a study room. Occasionally guest room may be on the ground floor with a bathroom and toilet (usually en-suite).The bedrooms are normally on the floor with the necessary convenience.

### 3.0 Research Methodology

The research design method employed in this study is the survey research method. According to Check and Schutt (2012), Survey research can be defined as the collection of information from a sample of individuals through their responses to questions, information were collected directly from the Estate Surveyors and Valuers in Enugu State. Questionnaires, Oral interview and Personal observations were used to retrieve relevant data from the population of study .One-way Analysis of Variance (One-way ANOVA) was used in testing the hypothesis, with  $p \leq 0.05$  indicating there is a significant variation among the mean scores on the dependent variable (Pallant, 2011).

### 4.0 Data Presentation and Analysis

A total of 50 questionnaires were distributed to Estate Surveying and Valuation Firms in Enugu State out of which 47 were returned while 3 were not returned.

#### 4.1 Presentation and Analysis of Responses

**Table 1: Comparison of the effect of the availability of the public infrastructural facilities on Duplex, 3bedroom flats and 2bedroom flats (with Adequate and Poor Public Infrastructural Facilities Respectively) in the Selected Locations in 2011 to 2013:**

Type of Residential Property	State of Infrastructural Facilities	Locations					
		Old GRA	New Haven	Golf Estate	Trans-Ekulu	Emene	Abakpa
Duplexes	With Adequate Infrastructural Facilities	2.73 <sup>A</sup>	2.66 <sup>A</sup>	2.63 <sup>A</sup>	2.03 <sup>B</sup>	1.04 <sup>D</sup>	1.48 <sup>C</sup>
	With Poor Infrastructural Facilities	2.57 <sup>A</sup>	2.27 <sup>B</sup>	2.24 <sup>B</sup>	1.19 <sup>D</sup>	1.12 <sup>D</sup>	1.90 <sup>C</sup>
Bungalows	With Adequate	2.27 <sup>A</sup>	2.00 <sup>B</sup>	1.55 <sup>C</sup>	1.42 <sup>CD</sup>	1.19 <sup>E</sup>	1.32 <sup>DE</sup>



	Infrastructural Facilities						
	With <b>Poor</b> Infrastructural Facilities	1.78 <sup>A</sup>	1.83 <sup>A</sup>	1.29 <sup>BC</sup>	1.16 <sup>C</sup>	1.32 <sup>B</sup>	1.75 <sup>A</sup>
<b>3 Bedroom Flats</b>	With <b>Adequate</b> Infrastructural Facilities	2.01 <sup>B</sup>	2.84 <sup>A</sup>	2.02 <sup>B</sup>	2.00 <sup>B</sup>	1.32 <sup>C</sup>	1.41 <sup>C</sup>
	With <b>Poor</b> Infrastructural Facilities	1.32 <sup>BC</sup>	1.95 <sup>A</sup>	1.46 <sup>B</sup>	1.29 <sup>BC</sup>	1.29 <sup>BC</sup>	1.19 <sup>C</sup>

Table 1 above is constructed to indicate the effect of availability of public infrastructure on duplexes, Bungalows, 3bedroom flats in the selected locations in 2011 - 2013. Duplexes with adequate infrastructure indicated superscript A with higher responses of relative average ranges of ₦30,000,000 - ₦35,000,000 in Old GRA, New Haven and Golf Estate respectively, with more indication of ₦25,000,000 - ₦30,000,000 in Trans-Ekulu displaying superscript B, and ₦20,000,000 - ₦25,000,000 was indicated respectively with more in Abakpa displaying superscript C, but mostly in Emene displaying D. While for Duplexes with poor infrastructure, Old GRA, New Haven and Golf Estate indicated more responses averaging ₦20,000,000 - ₦25,000,000 with superscript A, B, and B, Abakpa indicate superscript C with less responses averaging ₦20,000,000 - ₦25,000,000, while Trans-Ekulu and Emene with superscript D respectively indicated averages of ₦15,000,000 - ₦20,000,000.

Bungalows with adequate infrastructure indicated superscript A and B with higher responses of relative average ranges of ₦15,000,000 - ₦17,500,000 in Old GRA and New Haven respectively, with more indication of ₦12,500,000 - ₦15,000,000 in Golf Estate, Trans-Ekulu, Abakpa respectively displaying superscript C, CD, DE and but mostly in Emene displaying E. While for Bungalows with poor infrastructure, New Haven, Old GRA and Abakpa indicated more responses averaging ₦12,500,000 - ₦15,000,000 with superscript A, A and A respectively, Emene, Golf Estate and Trans-Ekulu indicate superscript B, BC and C respectively with less responses averaging ₦10,000,000 - ₦12,500,000.

3 bedroom flats with adequate infrastructure indicated superscript A with higher responses of relative average ranges of ₦11,000,000 - ₦13,000,000 in New Haven, with more indication of ₦9,000,000 - ₦11,000,000 in Golf Estate, Old GRA, Trans-Ekulu displaying superscript B, B and B respectively and ₦7,000,000 - ₦9,000,000 was indicated respectively with displaying superscript C and C. While for 3-bedroom flat with poor infrastructure New Haven indicated more responses averaging ₦8,000,000 - ₦10,000,000 with superscript A, Golf Estate, Old GRA, Trans-Ekulu, Emene and with Abakpa being with the most responses which indicates superscript B, BC, BC, BC and C with responses averaging ₦6,000,000 - ₦8,000,000.

**Table 2: Comparison of the effect of availability of public infrastructural facilities on Duplexes, Bungalows and 3bedroom flats (with Adequate and Poor Public Infrastructural Facilities Respectively) in the Selected Locations in 2014 to 2016:**

Type of Residential Property	State of Infrastructural Facilities	Locations					
		Old GRA	New Haven	Golf Estate	Trans-Ekulu	Emene	Abakpa
<b>Duplexes</b>	With <b>Adequate</b> Infrastructural Facilities	2.78 <sup>A</sup>	2.69 <sup>A</sup>	2.83 <sup>A</sup>	2.32 <sup>B</sup>	1.08 <sup>C</sup>	1.16 <sup>C</sup>
	With <b>Poor</b>	2.70 <sup>A</sup>	1.87 <sup>B</sup>	2.80 <sup>A</sup>	1.36 <sup>C</sup>	1.12 <sup>C</sup>	1.98 <sup>B</sup>

	Infrastructural Facilities						
<b>Bungalows</b>	With <b>Adequate</b> Infrastructural Facilities	2.84 <sup>A</sup>	1.81 <sup>C</sup>	2.17 <sup>B</sup>	1.88 <sup>C</sup>	1.16 <sup>E</sup>	1.42 <sup>D</sup>
	With <b>Poor</b> Infrastructural Facilities	1.59 <sup>B</sup>	1.97 <sup>A</sup>	2.05 <sup>A</sup>	1.57 <sup>B</sup>	1.12 <sup>C</sup>	1.29 <sup>C</sup>
<b>3 Bedroom Flats</b>	With <b>Adequate</b> Infrastructural Facilities	2.06 <sup>A</sup>	1.23 <sup>C</sup>	2.17 <sup>A</sup>	1.59 <sup>B</sup>	1.16 <sup>C</sup>	1.08 <sup>C</sup>
	With <b>Poor</b> Infrastructural Facilities	1.32 <sup>A</sup>	1.29 <sup>A</sup>	1.41 <sup>A</sup>	1.32 <sup>A</sup>	1.08 <sup>B</sup>	1.04 <sup>B</sup>

Table 2 above is constructed to indicate the effect of availability of public infrastructure on on duplexes, Bungalows, 3 bedroom flats in the selected locations in 2014 – 2016. Duplexes with adequate infrastructure indicated superscript A, A, with higher responses of relative average ranges of ₦10,000,000 – ₦12,000,000 in Golf Estate and Old GRA respectively, New Haven with indication of ₦8,000,000 – ₦10,000,000 displaying superscript A, and Trans- Ekulu, Abakpa and Emene displaying superscript B, C and C respectively with indication of ₦8,000,000 – ₦10,000,000. While for Duplexes with poor infrastructure, Golf Estate and Old GRA, indicated more responses averaging ₦30,000,000 – ₦35,000,000 with superscript A, A respectively, Abakpa and New Haven indicate superscript B, B respectively with less responses averaging ₦25,000,000 – ₦30,000,000, while Trans-Ekulu and Emene with superscript C, C respectively indicated averages of ₦20,000,000 – ₦25,000,000.

Bungalows with adequate infrastructure indicated superscript A with higher responses of relative average ranges of ₦20,000,000 – ₦22,500,000 in Old GRA and with more indication of ₦17,500,000 – ₦20,000,000 in Golf Estate displaying superscript B, Trans-Ekulu and New Haven indicated ₦17,500,000 – ₦20,000,000 displaying superscript C respectively, Abakpa and Emene indicated ₦15,000,000 – ₦17,500,000 showing Abakpa with Superscript D but mostly in Emene displaying 3 bedroom flats with adequate infrastructure indicated superscript A, A with higher responses of relative average ranges of ₦10,000,000 – ₦12,000,000 in Golf Estate and Old GRA, with more indication of ₦8,000,000 – ₦10,000,000 in Trans-Ekulu, New Haven, Emene, Abakpa B, C, C, C respectively. While for 3 bedroom flats with poor infrastructure Golf Estate, Old GRA, Trans Ekulu, New Haven, Emene indicated more responses averaging ₦7,000,000 – ₦9,000,000 with superscript A, A, A, A and B and with Abakpa being with the most responses which indicates superscript B.

superscript E. While for Bungalows with poor infrastructure Golf Estate and New Haven indicated more responses averaging ₦15,000,000 – ₦17,500,000 with superscript A, A, Old GRA and Trans Ekulu indicated responses averaging ₦12,500,000 – ₦15,000,000 with superscript B, B, Abakpa and Emene indicated responses averaging ₦12,500,000 – ₦15,000,000 with superscript C, C.

3 bedroom flats with adequate infrastructure indicated superscript A, A with higher responses of relative average ranges of ₦10,000,000 – ₦12,000,000 in Golf Estate and Old GRA, with more indication of ₦8,000,000 – ₦10,000,000 in Trans-Ekulu, New Haven, Emene, Abakpa B, C, C, C respectively. While for 3 bedroom flats with poor infrastructure Golf Estate, Old GRA, Trans Ekulu, New Haven, Emene indicated more responses averaging ₦7,000,000 – ₦9,000,000 with superscript A, A, A, A and B and with Abakpa being with the most responses which indicates superscript B.

**Table 3: Comparison of the effect of availability of public infrastructural facilities on Duplexes, Bungalows and 3bedroom flats (with Adequate and Poor Public Infrastructural Facilities Respectively) in the Selected Locations in 2017 to 2020:**

Type of Residential Property	State of Infrastructural Facilities	Locations					
		Old GRA	New Haven	Golf Estate	Trans-Ekulu	Emene	Abakpa
Duplexes	With Adequate Infrastructural Facilities	2.88 <sup>A</sup>	2.32 <sup>B</sup>	2.84 <sup>A</sup>	1.92 <sup>C</sup>	1.61 <sup>D</sup>	1.89 <sup>C</sup>
	With Poor Infrastructural Facilities	2.49 <sup>B</sup>	1.95 <sup>C</sup>	2.75 <sup>A</sup>	1.79 <sup>D</sup>	1.55 <sup>E</sup>	2.00 <sup>C</sup>
Bungalows	With Adequate Infrastructural Facilities	2.74 <sup>A</sup>	2.02 <sup>B</sup>	2.76 <sup>A</sup>	2.04 <sup>B</sup>	1.32 <sup>C</sup>	1.19 <sup>C</sup>
	With Poor Infrastructural Facilities	1.76 <sup>B</sup>	1.51 <sup>C</sup>	2.16 <sup>A</sup>	1.58 <sup>C</sup>	1.43 <sup>C</sup>	1.23 <sup>D</sup>
3 Bedroom Flats	With Adequate Infrastructural Facilities	2.17 <sup>A</sup>	1.60 <sup>B</sup>	2.10 <sup>A</sup>	1.66 <sup>B</sup>	1.51 <sup>B</sup>	1.42 <sup>B</sup>
	With Poor Infrastructural Facilities	1.19 <sup>BC</sup>	1.08 <sup>C</sup>	1.23 <sup>BC</sup>	1.26 <sup>A</sup>	1.19 <sup>BC</sup>	1.12 <sup>BC</sup>

Table 3 constructed to indicate the effect of availability of public infrastructure on duplexes, Bungalows, 3bedroom flats in the selected locations 2017 – 2020. Duplexes with adequate infrastructure indicated superscript A, A with higher responses of relative average ranges of ₦40,000,000 – ₦45,000,000 in Old GRA and Golf Estate respectively, with more indication of ₦35,000,000 – ₦40,000,000 in New Haven, Trans-Ekulu and Abakpa displaying superscript B, C and C respectively and ₦30,000,000 – ₦35,000,000 was indicated in Abakpa displaying superscript D. While for Duplexes with poor infrastructure, Golf Estate and Old GRA, indicated more responses averaging ₦35,000,000 – ₦40,000,000 with superscript A, and B respectively, Abakpa and New Haven and Trans-Ekulu indicate superscript C, C and D with averages responses averaging ₦30,000,000 – ₦35,000,000 respectively, while Emene with superscript E indicated more of ₦25,000,000 – ₦30,000,000.

Bungalows with adequate infrastructure indicated superscript A, A with higher responses of relative average ranges of ₦22,500,000 – ₦25,000,000 in Golf Estate and Old GRA respectively, with indication of ₦20,000,000 – ₦22,500,000 in Trans-Ekulu and New Haven respectively displaying superscript B but less in Emene and Abakpa displaying superscript E. While for Bungalows with poor infrastructure, Golf Estate and Old GRA indicated more responses averaging ₦17,500,000 – ₦20,000,000 with superscript A and B respectively, Trans-Ekulu, New Haven, Emene and Abakpa which indicate superscript C, C, C and D respectively with more responses averaging ₦15,000,000 – ₦17,500,000.

3 bedroom flats with adequate infrastructure indicated superscript A with higher responses of relative average ranges of ₦11,000,000 – ₦13,000,000 in Old GRA, Golf Estate respectively, Trans Ekulu, New Haven, Emene and Abakpa with indication of ₦9,000,000 - ₦11,000,000 displaying superscript B respectively. While for 3-bedroom flat with poor infrastructure Trans Ekulu, Golf Estate, Emene, Old



GRA, Abakpa and New Haven indicated responses ₦8,000,000 ₦10,000,000 with superscript A, BC, BC, BC, BC and C.

**4.2 Test of Hypotheses**

**H<sub>01</sub>:** Availability of public infrastructure have no significant effect on the residential housing developments in the selected areas of Enugu.

**Table 4: Level of the Effect of Availability of Public Infrastructural Facilities on Residential Housing Development in the Selected areas of Enugu;**

<b>Level of Effect</b>	<b>Old GRA</b>	<b>New Haven</b>	<b>Golf Estate</b>	<b>Trans-Ekulu</b>	<b>Emene</b>	<b>Abakpa</b>
<b>Weighted Means</b>	4.77	4.79	4.21	4.08	4.43	4.11
<b>Rank</b>	2 <sup>nd</sup>	1 <sup>st</sup>	4 <sup>th</sup>	6 <sup>th</sup>	3 <sup>rd</sup>	5 <sup>th</sup>

From Table 4 above, the weighted means indicated that there is significant effect of the availability of public infrastructural facilities by virtue of the fact that all the mean indicated values above 4 which stated by the decision rule that any value going higher than 4 is tending towards strongly agreeing. These variations were also determined to be significant with the use of One-way Analysis of Variance (ANOVA). Therefore, we reject the null hypothesis (Availability of public infrastructure have no significant effect on residential housing developments in the selected areas of Enugu) and accept the alternative (Availability of public infrastructure have significant effect on housing developments in the selected areas of Enugu State).

However, there is higher effect in New Haven being the 1<sup>st</sup> in rank with weighted mean of 4.79, Old GRA being the 2<sup>nd</sup> in rank with weighted mean of 4.77, Emene being the 3<sup>rd</sup> in rank with weighted mean of 4.43, Golf Estate being the 4<sup>th</sup> in rank with weighted mean of 4.21, with Abakpa being the 5<sup>th</sup> in the rank with weighted mean of 4.11 and Trans-Ekulu being the least with the weighted mean of 4.08.

**5.0 Findings and Conclusion**

**5.1 Findings**

The study revealed that there is significant impact of the availability of public infrastructure on residential housing development in the different residential property types comprising: Duplexes, Bungalows and 3-bedroom flats that are found in the selected locations of Enugu which include; Old GRA, New Haven, Golf Estate, Trans -Ekulu, Emene and Abakpa, though to different extents, with higher effect in New Haven, followed by Old GRA, Emene, Golf Estate, Abakpa and Trans-Ekulu being the least.

We also rejected the null hypothesis which states that Availability of public infrastructure have no significant effect on the residential housing developments in the selected areas of Enugu because all the four identified impact factors comprising; increase in demand of properties in the neighborhood, reduction in rate of void on the property, increase in the value of the property and increase in the number of residence indicated weighted mean well above 4.00. Therefore revealing that the level of availability of different infrastructure have significant impact on the residential housing developments in Enugu State.

**5.2 Conclusion**

This study has been able to look at the availability and impact of public infrastructure on residential real estate development in selected locations in Enugu state. These locations were selected because they are predominantly occupied by residential properties with the required characteristics, though in varying proportions. With the analysis and the findings from the research, I have been able to see the degree in which the availability of public infrastructural facilities affects the residential properties in the selected areas in Enugu State. This is against the dealings of some property owners, agents and developers in Enugu who arbitrarily place Capital Values on properties without giving due consideration to factors that determine the Capital Value of a property. The research also made me discover that increase in the public infrastructure can be attributable to factors such as; level of demand, level of void,, urbanization and population growth, etc.

### **5.3 Recommendations**

From the findings, the researcher hereby gives the following recommendations:

The Estate Surveyors should give the clients (Property owners/investors) the advice not to always wait for government to provide all the public infrastructural facilities needed in their property locations. Property owners can come together, pull funds together and provide these facilities especially the affordable ones that individuals can provide like security, pipe born water and so on because the availability of them will also increase the value of their investment to their own benefits.

Aside the provision of public infrastructural facilities by the government or individuals that can afford it, there is need for these public infrastructural facilities to be properly used and maintained so that they will be continually enjoyed. By this, the public are urged to desist from any action that will render the public infrastructural facilities unusable or unfit like pollution of pipe-borne water, blockage of drainage system etc. The public should be adequately sensitized on the need to use the facilities properly and there should be sanction if need be so as to curtail the excessiveness in manhandling these public infrastructural facilities.

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