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C O.Iroham[1], T Okubanjo[1] O Joshua[2], H I Okagbue[3] M E Emetere[4] O A Akinjare[1] J N Peter[1] and O M Akinwale[1]
[1]Department of Estate Management, Covenant University, Ota, Ogun State Nigeria
[2]Department of Building Technology, Covenant University, Ota, Ogun State Nigeria
[3]Department of Mathematics, Covenant University, Ota, Ogun State Nigeria
[4]Department of Physics, Covenant University, Ota, Ogun State Nigeria

Abstract: Traffic gridlock has been a concern in research particularly in determining its effect on property values. Resultant findings have either been a negative or positive impact. For the case of Apapa in Lagos State which is the focus of this present study, traffic gridlock has been an experience of over ten years, hence the need to discover its impact on various property value types as against the collective findings in most previous research. Student-T test of significance at a 95% level of confidence was adopted with results derived for all property types of the calculated T result far outweighing that of the stipulated Tabulated T result of 1.645. These findings for all property types indicate that the increase in property values for various property types have not been distorted by the traffic gridlock and as such investors in residential properties in the study area will always make their profit notwithstanding the gridlock. The researchers hereby advocated further research in determining the choice of residency in Apapa notwithstanding the traffic gridlock.

Keywords: Traffic Gridlock, Residential Property, Property Values, Apapa

1. Introduction

One vital way by which cities develop has been linked to free movement to enhance economic activities which can easily be boosted by a good traffic flow [1]. However, one major hindrance to the free flow of movement is traffic gridlock which the World Bank has attributed to create about 54.5% of all noticeable urban transport externalities. Traffic gridlock which is also regarded as traffic congestion can be defined as a form of traffic blockage whereby incessant queue of various automobiles particularly vehicles obstruct a whole network of interconnected streets resulting to slower speeds, longer trip times and even a complete standstill of vehicular movement. Traffic gridlock is broadly caused by two principal categories. They are micro-level and macro-level factors. The micro-level factors relate to the road while macro-level factors relate to the overall demand for road use. Examples of the micro-level factors include struggle for people and freight to move at the same time, too many vehicle competing for limited road space, accident, vehicle breakdown, poorly timed traffic signal and other special occurring events on the roads such as political rallies, mass social gatherings amongst others. Examples of the macro-level factors include land use patterns, car ownership trends, regional economic dynamics,

infrastructure investment, income level, and employment patterns amongst others [2]. In the long run traffic gridlock results to increase cost and loss of work hours amongst others [3]. Others are lost worker productivity, lost business earnings, higher transportation cost, increase in time spent on travelling, additional cost and less consistent times for pick-up and delivery for those that operate trucks. In fact from study conducted by the Portland Business Alliance, Port of Portland and Metro it was discovered that traffic gridlock will result to the loss of 6, 500 jobs in the local economy and $844 million a year by 2025[4]. With the increase in ownership of vehicles to support transportation particularly in the developing economies to a tune of about 15 to 20% annually, traffic gridlock is not farfetched particularly in Lagos State, Nigeria [5]. This traffic gridlock has however been established in virtually every capital city in Nigeria [6]. However, for the case of Lagos State which is believed to be one of the fastest growing cities of the world, traffic gridlock is very much evident. This is to buttress the assertion of [7-10] that traffic gridlock is a function of the population of any area. Other reasons attributed to traffic gridlock in Nigeria particularly in Lagos State include, the inertia of spatial planning in metropolitan Lagos[11]; Inability of road network to contain the volume of traffic that make use of it [12]; insufficient road infrastructure, dilapidated road condition; inadequate traffic planning, absence of integrated transport systems, behavior of road users particularly the drivers and accidents [13,14]. According to Aderamo & Atomode [15] road intersection, traffic wardens and parking problems are major causes of traffic gridlocks on the roads. Ukpata and Etika [16] disclosed that reckless driving is the most important cause of traffic congestion while poor road networks, lack of parking facilities, poor drainage, inadequate road capacity, poor parking habits, poorly designed junctions/roundabouts, lack of efficient mass transport system, poor traffic control/management and presence of heavy vehicles were discovered to be other trigging factors. Olaogbebikan, Ikpechukwu, Akinsulire and Enosko [17] attributed traffic gridlock in the state to much dependency on small occupation vehicles, indiscriminate parking, on-street trading, narrow road, incapacity of the traffic management agencies to evacuate crashed or breakdown vehicles on time, loading and off-loading of goods and passengers on the road, and ineffective traffic control measures. Results from research conducted by Popoola, Abiola and Adeniji [18] reveals inadequate road capacity, poor drainage system, poor parking habit, poor traffic management, presence of heavy trucks, poor road pavement, poor design junctions/round-about, lack of road furniture and lack of pedestrian and parking facilities as causes of traffic gridlock in the state. Impatience by road users in the state has also been discovered as another triggering factor of traffic gridlock in the state [19]. Notwithstanding efforts by scholars in transport management and various road traffic management strategies employed by the state such as the one way approach, construction of new routes and flyovers, park and ride system, application of odd and even numbers light rail schemes, use of water ways, Bus Rapid Transit (BRT) and para-mass transit system amongst others [20-27], the traffic gridlock is yet to be eliminated. While Lagos is synonymous with traffic gridlock [1, 26, 28-30] however that of Apapa, which lies around the mouth of Lagos lagoon, has become unbearable due to the location of the Tincan Island Port, the second largest in West Africa after that in Abijan. In Apapa, there are noticeable tankers packed on the road causing traffic gridlock in the area substantiating the findings of [26, 32]. This traffic gridlock has manifested in various forms describing the different types of gridlock propounded by Brownfield, Graham, Eveleigh, Ward, Robertson and Allsop [33]. These are recurrent congestion occurring at regular peak times usually mornings and evenings. Non-recurrent congestion, occurring at non regular times usually due to vehicle breakdowns and pre-congestion also known as borderline congestion which occurs where there is a free-flow conditions breakdown while full congestion is yet to occur. Due to the slow pace of movement which this traffic gridlock brings about, its out-turn on economic development can always been linked. One of such is the linkage of gridlock with property values.

2.0 Effect of road, accessibility, traffic gridlock on property values

Road can be described as the greatest investment of any nation where its citizens are shareholders. This statement buttresses the import of road, its network and accessibility because in every given society people are bound to abide. The accessibility of any given road thereby relates to location which has been attributed as the principal determinant of property values[34]. This explains why according to Aderamo [23], road network constitutes a significant constituent in urban development as roads provide accessibility to the different land uses in the urban area. In fact even the mere announcement of proposed road projects is believed to have effect on property values which was discovered to be a function on the size of the proposed project [35]. This is in line with the classic urban location theory which states that lower transport costs resulting from accessibility will bring about higher land and property values. Notwithstanding, academic researches needed to be conducted to situate peculiarities of various places. In light of this, various researches have tried to link road, its improvement, accessibility with economic development of which lies research in values of properties[36]. Right from 1956 when the Highway revenue Act came up, studies have sprung up on the effect of highways on property values. One of such remarkable earlier studies is that carried out by Adkins [37] in Dallas, Houston and San Antonio. An appreciable rise in value of about 450% was discovered particularly in Dallas and Houston while the appreciable rise in value was more in manufacturing land use to a tune of about 200% while single-family residential land use had an insignificant rise in value in San Antonio. Bone and Wohl [38] carried out a similar study in Massachusetts. They had divergent results of which in one community the highway has resulted in the appreciation of property values while in the other community the highway had little effect on property values. Ever since then other researchers have also come up with various divergent findings on highway improvement on property values. One of such recent studies is that carried out in Netherlands where it was discovered that changes in accessibility resulting from highway development project has a significant positive effect on the price of housing in close by municipalities, even though the ensuing enhancement in noise pollution and traffic intensity levels brought about a decline in prices. However, the combination of all the effects of all externalities, the effect of highway development on house prices is positive and the effect is prominent even before the completion of the project as a result of public anticipation effect [39]. Some other researchers have identified road construction to have a positive impact on property values [40-44] discovered varied effects of both a positive and negative nature while Aigbe, Ogundele and Aliu [45] discovered a negative effect on property values from road construction. The varied results gotten from the researches are not farfetched considering the fact that apart from boost in economic activities, certain externalities such as noise and air pollution, compulsory purchase and acquisition by government results to the negative effects on property values [46-49]. It is obvious then that whatsoever will inhibit the free flow of movement of people on the way will attract attention for research. This has even led to the study of effect of speed bumps on residential property values where divergent results were attained. To most of the respondents speed bumps is related with decline in values of residential property while for the elderly and homeowners with children, that enhances the value of residential properties [50]. Much more will be the likelihood of an envisaged attention by researchers on greater impediment to movement such as traffic gridlock even as it relates to property values. However, there is dearth of literature on impact of gridlock on property values.

Research on the effect of traffic gridlock on property values as recorded in the early eighties was conducted in Grand Rapids Michigan. It was discovered that residential property values displayed a surprising high elasticity with respect to decrease in traffic flow [51]. This is against findings gotten from some latter researches where decrease in traffic flow results to decrease in housing values [52-54]. There was a varied result gotten from a research conducted in Portsmouth city, England where it turned out to be that the effect of traffic gridlock on property (terrace houses) values varies according to economic conditions. During the period of high sales demand and low availability of property the impact is less compared to periods of low demand and higher supply

of property [55]. Hou [56] likewise discovered that house prices tend to increase more with vicinities of higher free flow that those of congested flow. However, this is more pronounced within the middle income neighbourhood compared to their counterparts in lowest and highest income neighbourhoods. In a more recent research relating traffic gridlock with house prices it was discovered that while there no significant relationship exist between congestion growth and house prices in rural areas and non-metro areas, the situation is different from the urban areas with an obvious adverse effect on house prices [57].
With all these varied results gotten it is imperative that a study of traffic gridlock and its impact on property values be studied in Apapa, Lagos State, Nigeria. This will enable findings of actual outcome of this gridlock.

3.0 Methods

This present study being a cross-sectional survey involves the distribution of seventy (70) questionnaires and Eight (8) questionnaires to practicing estate surveying and valuation firms in Lagos Island and Apapa respectively. The choice of Lagos Island is due to the much concentration of estate surveying and valuation firms in Lagos Island while the entire estate surveying and valuation firms in Apapa, being the study area were surveyed. The field work was carried out within a space of three months (February –May, 2019). The data gotten was principally on rental values of all types of residential properties in Apapa within a space of 18 years (year 2000 and year 2018). This was intended to capture both the period of free traffic flow and traffic gridlock in the study area. Data collected was analyzed using the Student T Test of Significance at the 95% confidence level hypothesized that the traffic gridlock had a negative effect on the various residential; property values in the study area. The choice of student T was due to its applicability in testing hypothesized significant difference between two pairs of sample means. In this study property values before and after the traffic gridlock in the study area were compared.

4.0 Results and Discussion

Out of the seventy (70) questionnaires distributed to estate firms in Ikeja and eight (8) questionnaires in Apapa, Lagos state, a total of sixty-eight (63) questionnaires were retrieved from the estate firms in Lagos Island and 5 questionnaires from Apapa. This represents a response rate of 87%. The researchers considered this substantial enough for a conclusive result. Moreover all estate surveying and valuation firm studied have dealings in the study area and have been in professional practice for between seven (7) and twenty-six (26) years.
For the various property types the values of such properties were analyzed before and after the gridlock using the Student-T Test of Significance at the 95% confidence level with the assumption that all other determinants of property values are kept constant. The analysis of the various property types are as follows:

Tenement building

Before Traffic Gridlock
$X_1 = 62.85$
$S^2_1 = 18250.84$
$N_1 = 506$

After Traffic Gridlock
$X_2 = 102.87$
$S^2_2 = 73574.71$
$N_2 = 619$

Calculating F ratio:

73574.71
18250.84 = 4.0313
Tab f = 1.00
Since Calf >tabf, we reject the null
Hence $S^2_1 \neq S^2_2$
Also $N_1 \neq N_2$
We deduce using Separate variance model with $_df = (N_1 + N_2) \div 2$

$$T = \frac{X_1 - X_2}{\sqrt{((S^2_1 N_1) + (S^2_2 N_2))}}$$

$$\frac{62.85 - 102.87}{\sqrt{((18250.84 \div 506) + (73574.71 \div 619))}}$$

$$\frac{40.02}{\sqrt{((36.0689) + (118.8606))}}$$

$$\frac{40.02}{\sqrt{(154.9295)}}$$

$$\frac{40.02}{12.4471}$$

Cal T = 3.2152
Tab T = $_df = (N_1 + N_2) \div 2$ (506 +619) ÷ 2 = 562.5
1 tail test directional of 562.5 @ 0.05 = 1.645

Decision Rule

Since Cal T > Tab T we reject null hypothesis meaning
Property Values of Tenement Building after the gridlock in Apapa is greater than Property Values of Tenement Building before the gridlock. Hence the gridlock had no impact on the increase of property values of tenement building in Apapa

Self-Contain

Before Traffic Gridlock

$X_1 = 124.78$

$S^2_1 = 2906.75$

$N_1 = 574$

After Traffic Gridlock

$X_2 = 194.73$

$S^2_2 = 6938.08$

$N_2 = 513$

Calculating F ratio:

$$\frac{6938.08}{2906.75} = 2.3869$$

Tab f = 1.00

Since Calf >tabf, we reject the null

Hence $S^2_1 \neq S^2_2$

Also $N_1 \neq N_2$

Wededuce using Separate variance model with $_df = (N_1 + N_2) \div 2$

$$T = \frac{X_1 - X_2}{\sqrt{((S^2_1 \div N_1) + (S^2_2 \div N_2))}}$$

$$\frac{124.78 - 194.73}{\sqrt{((2906.75 \div 574) + (6938.08 \div 513))}}$$

$$\frac{69.95}{\sqrt{((5.0640) + (13.5245))}}$$

$$\frac{69.95}{\sqrt{(18.5885)}}$$

$$\frac{69.95}{4.3114}$$

Cal T = 16.2244

Tab T = $_df = (N_1 + N_2) \div 2$ (574 +513) ÷ 2 = 543.5

1 tail test directional of 543.5 @ 0.05 = 1.645

Decision Rule

Since Cal T > Tab T we reject null hypothesis meaning

Property Values of Self Contain after the gridlock in Apapa is greater than Property Values of Self Contain before the gridlock. Hence the gridlock had no impact on the increase of property values of Self Contain in Apapa

Two bedroom Flat

Before Traffic Gridlock

$X_1 = 180.03$

$S^2_1 = 8612.10$

$N_1 = 454$

After Traffic Gridlock

$X_2 = 353.98$

$S^2_2 = 29803.76$

$N_2 = 452$

Calculating F ratio:
29803.76
8612.10 = 3.4607
Tab f = 1.00
Since Calf >tabf, we reject the null
Hence $S^2_1 \neq S^2_2$
Also $N_1 \neq N_2$
We deduce using Separate variance model with $_d f = (N_1 + N_2) \div 2$

$$T = \frac{X_1 - X_2}{\sqrt{((S^2_1 N_1) + (S^2_2 N_2))}}$$

$$\frac{180.03 - 353.98}{\sqrt{((8612.10 \div 454) + (29803.76 \div 452))}}$$

$$\frac{173.95}{\sqrt{((18.9694) + (65.9375))}}$$

$$\frac{173.95}{\sqrt{(84.9069)}}$$

$$\frac{173.95}{18.8779}$$

Cal T = 18.8779
Tab T = $_d f = (N_1 + N_2) \div 2$ (454 +452) ÷ 2 = 453
1 tail test directional of 453 @ 0.05 = 1.645

Decision Rule
Since Cal T > Tab T we reject null hypothesis meaning
Property Values of Two Bedroom Flat after the gridlock in Apapa is greater than Property Values of Two Bedroom flat before the gridlock. Hence the gridlock had no impact on the increase of property values of Two Bedroom Flat in Apapa

Three Bedroom Flat
Before Traffic Gridlock
$X_1 = 524.42$
$S^2_1 = 72479.42$
$N_1 = 495$

After Traffic Gridlock
$X_2 = 1033.96$
$S^2_2 = 45160.04$
$N_2 = 490$

Calculating F ratio:
72479.42
45160.04 = 1.6049
Tab f = 1.00
Since Calf >tabf, we reject the null

Hence $S^2_1 \neq S^2_2$
Also $N_1 \neq N_2$
We deduce using Separate variance model with $_df = (N_1 + N_2) \div 2$

$$T = \frac{X_1 - X_2}{\sqrt{((S^2_1 \div N_1) + (S^2_2 \div N_2))}}$$

$$\frac{524.42 - 1033.96}{\sqrt{((72479.42 \div 495) + (45160.04 \div 490))}}$$

$$\frac{509.54}{\sqrt{((146.4231) + (92.1633))}}$$

$$\frac{509.54}{\sqrt{(238.5864)}}$$

$$\frac{509.54}{15.4462}$$

Cal T = 32.9880
Tab T = $_df = (N_1 + N_2) \div 2$ (495 +490) ÷ 2 = 492.5
1 tail test directional of 492.5 @ 0.05 = 1.645

Decision Rule

Since Cal T > Tab T we reject null hypothesis meaning
Property Values of Three Bedroom Bungalow after the gridlock in Apapa is greater than Property Values of Three Bedroom Bungalow before the gridlock. Hence the gridlock had no impact on the increase of property values of Three Bedroom Bungalow in Apapa

Four Bedroom House

Before Traffic Gridlock
$X_1 = 1234.71$
$S^2_1 = 442192.31$
$N_1 = 507$

After Traffic Gridlock
$X_2 = 1942.06$
$S^2_2 = 1099820.10$
$N_2 = 452$

Calculating F ratio:

$$\frac{1099820.10}{442192.31} = 2.4872$$

Tab f = 1.00
Since Calf >tabf, we reject the null
Hence $S^2_1 \neq S^2_2$
Also $N_1 \neq N_2$
We deduce using Separate variance model with $_df = (N_1 + N_2) \div 2$

$$T = \frac{X_1 - X_2}{\sqrt{((S^2_1 \div N_1) + (S^2_2 \div N_2))}}$$

$$\frac{1234.71 - 1942.06}{\sqrt{((442192.31 \div 507) + (1099820.10 \div 452))}}$$

707.35
√ ((872.1742) + (2433.2303))

707.35
√ (3305.4045)
707.35
57.4926
Cal T = 12.3033
Tab T = $_{d}f$= (N_1, N_2)÷2 (507 +452) ÷ 2 = 479.5
1 tail test directional of 479.5 @ 0.05 = 1.645

Decision Rule

Since Cal T > Tab T we reject null hypothesis meaning
Property Values of Four Bedroom House after the gridlock in Apapa is greater than Property Values of Four Bedroom House before the gridlock. Hence the gridlock had no impact on the increase of property values of Four Bedroom House in Apapa

5.0 Recommendation/Concluding Remarks

This research work is novel as it did not just study traffic gridlock with respect to property values which is sparse in literature but focused on Lagos, Apapa known for its huge traffic issues. More so Lagos is one of the vibrant property markets in Nigeria together with Portharcout and Abuja. It has also been established that majority of the estate surveyors and valuers in Nigeria have their head offices in Lagos State. An earlier related study in Nigeria focused on commercial properties in Bauchi State while this present study is hinged on residential properties. Other earlier researches carried out outside the country studied residential properties holistically but this present study focused on the individual residential properties found in the study area. Thus, this present research has been able to prove that beyond all negative externalities associated with traffic gridlock, Apapa still commands increase in the various property values. It is therefore obvious that over the years that the traffic gridlock in Apapa had no effect on the values of all residential property types. Hence, the researchers opine that investors in residential properties can always make such investment which will invariably turn out profitable in the study area notwithstanding the traffic gridlock. The question then is what are the features in Apapa that makes residents to opt for the area notwithstanding the traffic gridlock? Are there other property types such as commercial, recreational, industrial that are affected by this gridlock? These are questions which further research related to this work in the study area will find out.

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References:

[1]. Adaramo, A. (2003). A Graph Theoretic Analysis of Intra-Urban Road Network in Ilorin, Nigeria, Journal of the Nigerian Institute of Social and Economic Research, 17, 18, 19, (1), (2), 221-240
[2]. Adejare , Q. A., Olusina, J. O., and Olaleye, J. B. (2017). Developing Bimodal Choice Functions for Lagos Urban Transportation System using Hybrid Technique. Journal of Engineering Research, 22(1), 11-22
[3]. Adekanmbi, S. T. (2015). The impact of traffic congestion on Lagos – Ibadan Road (A case study of Lagos end toll gate, Lagos State. Unpublished B.Sc Dissertation Department of Transport Management Faculty of Management Sciences, Ladoke Akintola University of Technology, Ogbomosho Oyo State Nigeria
[4]. Aderamo, A. J. (1990). Road Development and Urban Expansion: The Case of Ilorin, Nigeria. Ph.D. Thesis submitted to the Department of Geography, University of Ilorin, Ilorin. Kwara state.
[5]. Aderamo, A. J & Atomode. T. I. (2011). Traffic Congestion at Road Intersection in Ilorin, Nigeria. Australian Journal of Basics and Applied Sciences, 5 (9), 1439-1448.
[6]. Adkins, W. G. (1959). Land value impacts of expressways in Dallas, Houston, and San Antonio, Texas, Highway Research Board Bulletin, Number 227, 1959
[7]. Aigbe, G.O, Ogundele, F.O and Aliu, I.R (2012). Road Facility and Maintenance in Lagos State Nigeria. British Journal of Arts and Social Sciences, 4(2), http//www.bjournal.co.uk/BJASS. Aspx
[8]. Al-Mumaiz M, and Evdorides H. (2017) Modeling the Impact of Road Construction on Land Value. A PhD Thesis submitted to the University of Birmingham UK. Ministry of Higher Education and Scientific Research, Iraq (MOHE)
[9]. Alimi R.K, Ayedun C.A and Oni A.S (2014). An Appraisal of the Relationship between Road Improvements and Immediate Neighborhood Residential Properties Values in Metropolitan Lagos. American International Journal of Contemporary Research, 4(6); 215-222
[10]. Aliyu, A. H., Abubakar, S. I. and Adamu, H. (2015). Impact of traffic congestion on commercial property rental values in Bauchi metropolis. Book of Proceedings - Academic Conference of Cambridge Publications & Research International on Sub-Sahara African Potentials in the New Millennium, 3(2). 30th July, 2015- FUTA, Hilltop Conference Hall, Akure, Ondo State
[11]. Ameyan, O. (1996). Environmental and Energy Issue in Urban Transport System Development Paper Presented at the FUMTA Seminar on Urban Transport Policy for Nigeria.Atubi, A. (2008). Journey to work pattern in the Niger Delta: An Empirical Analysis of Warri and Environs Department of Geography and Regional Planning, Delta State University, Abraka.
[12]. Aworemi, J. R., Abdul-Azeez, I. A., Oyedokun, A. J. and Adewoye, J. O (2009). A study of the causes, effects and Ameliorative Measures of Road Traffic Congestion in Lagos Metropolis. European Journal of Social Sciences. II (1), 2009
[13]. Bagby, D. G. (1980) The effect of traffic flow on residential property values. Journal of the American Planning Association, 46(1), 88-94
[14]. Bello, S. A. (1993). Urban Public Transport in a Growing City: The Case of Ilorin, Nigeria. Ph.D. Thesis Submitted to the Department of Geography, University of Ilorin, Ilorin. Kwara state.
[15]. Bolade, T. (1989). Transport in Metropolitan Lagos, Transport Review, 16(2).
[16]. Bone, A. J. and Wohl, M. (1959). Massachusetts route 128 impact study, Highway Research Board Bulletin, Number 227

[17]. Bowhill, P. (2008). The effect of traffic congestion on property values in Portsmouth. (unpublished BSc dissertation), School of Environmental Design and Management, University of Portsmouth, Portsmouth
[18]. Brownfield, J., Graham, A., Eveleigh, H., Ward, H., Robertson, S., and Allsop, R. (2003). Congestion and accident risk. Road safety research report No.44, Department of Transport UK
[19]. Carey, J. (2001). Impact of highways on property values: Case study of the superstition freeway corridor. (A. D. o. Transportation, ed.), Arizona, USA.
[20]. Chay, K. Y. and Greenstone, M. (2005). Does Air Quality Matter? Evidence from the Housing Market. Journal of Political Economy, 113(2), 376–424
[21]. Downie, A. (2008). The World Worst Traffic Jams time. Available at: http://www.time/world/article/0,8599,1733872,00.html. (Retrieve on 28th May, 2015.
[22]. Fadare, S. O. and Ayantoyinbo, B. B. (2010). A study of the effects of road traffic congestion on freight movement in Lagos Metropolis. European Journal of Social Sciences, 16(3), 429- 437
[23]. Gatauwa, J. M., and Murungi, M. (2015). Infrastructure Development and Real Estate Values in Meru County, Kenya. Research Journal of Finance and Accounting, 6(8), 212-221
[24]. Graham, J. E. and Jones, A. T. (2019). A bump in the road: speed bumps' impact on property values, International Journal of Housing Markets and Analysis, 12(1), 43-58
[25]. Hanley, N., Shogren, J. F., and White, B. (2001). "Introduction to Environmental Economics," 1/Ed. Oxford University Press
[26]. Hou, Y. (2016). Traffic congestion, accessibility to employment, and housing prices: A study of single-family housing market in Los Angeles County. Urban Studies, 54(15), 3423–3445
[27]. Iroham, C. O., Durodola, O. D., Oluwatobi, A. O. and Peter, N. J. (2015). Proceedings of the 25th International Business Information Management Association Conference- Innovation Vision 2020: From Regional Development Sustainability to Global Economic Growth, IBIMA 2015, 3756-3763
[28]. Jimi-Oni, M. and Oluwatobi, A. O. (2017). Impact of Road Rehabilitation on Property Value: A Case of Lasu-Isheri Road, Igando, Lagos State. Covenant Journal of Research in the Built Environment, 5(2), 75-88
[29]. Jin, J. and Rafferty, P. (2018). Externalities of auto traffic congestion growth: Evidence from the residential property values in the US Great Lakes. Journal of Transport Geography, 70(c), 131-140
[30]. Knaap, G. (1998). The Determinants of Residential Property Values: Implications for Metropolitan Planning, Journal of Planning Literature, 12(3), 267-282
[31]. Kutz, M., ed. (2008). "Environmentally conscious transportation," Vol. 1, pp. 1-350. John Wiley and Sons, Inc., New Jersey.
[32]. Lagos Metropolitan Area Transport Authority (LAMATA) (2014): Description of transportation projects currently happening in Lagos. http:///www.lamata.ng.com. Accessed 12/20/2016
[33]. Levkovich, O., Rouwendal, J., and Van Marwijk, R. V. (2016). The effects of highway development on housing prices. Transportation, 43(2), 379 – 405
[34]. Moses, S. O. (2011). Information technology applications in transportation system. Proceedings of the National Conference of Nigerian Society of Engineers in Calabar.
[35]. Neelawala, P., Wilson, C., and Robinson, T. (2009). Impacts of Major Roads on Property Values: An Analysis of an Existing and a Proposed Road Corridor Project,

School of Economics and Finance, Queensland University of Technology, Brisbane Australia (2009)

[36]. Obadina, E. O., and Akinyemi, O. Y. (2018). Analysis of Traffic Congestion on Lagos/Abeokuta Expressway-Agege Motorway in Lagos Metropolis. Journal of Environment and Earth Science, 8(1), 7-17

[37]. Odeleye, J. A. and Oni, S. I (2007). A study of road traffic congestion in selected corridors of Metropolis Lagos. Nigeria. Proceedings of 11th World Conference on Transport Research, Berkeley, California. 24/6/2007

[38]. OECD (2007). (Organisation for Economic Cooperation and Development) and ECMT (European Conference of Ministers of Transport). Managing Urban Traffic Congestion. Joint Transport Research Centre

[39]. Ogunbodede, E. F. (2009). Assessments of Traffic Congestions in Akure (Nigeria) using GIS approach: Lessons and Challenges for Urban Sustenance; at http://download.sue- mot.org/Conference007/Papers/Ogunbodede.pdf. Retrieved on 28th May, 2015

[40]. Ogunleye O.S. (2011). Spatial Structure of Road Infrastructure in Ekiti State, Nigeria: Options for Transformation. Advances in Natural Science, 4(2), 138-142

[41]. Ogunsanya, A. A. (1987). Traffic Congestion in an Urban Centre: The Case of Ilorin, Nigeria. Nigerian Geographical Journal, 27(1& 2), 84-95.

[42]. Olagunju, K. (2015). Evaluating traffic congestion in developing countries – a case study of Nigeria. A paper presented at the 2015 chartered institute of logistics and transport (CILT) Africa forum held at Mount Meru Hotel Arusha, Tanzania

[43]. Olaogbebikan, J. E, Ikpechukwu, N., Akinsulire, E. S. & Enosko, O. (2013). Traffic Management Problems in Lagos: A Focus on Alaba International Market Road, Ojo, Lagos State Nigeria. Journal of Economics and Sustainable Development, 4(4), 144-153

[44]. Omiunu, F. G. I. (1988). Flooding and traffic management in Benin City Region in Sada, P.O. and Odemerho, F.O. (eds) Environmental Issues and Management Development Lagos: Evans Brothers (Nig.) Ltd.

[45]. Oruonye, E. D. (2014). An assessment of the impact of road construction on land use pattern in urban centres in Nigeria, A case study of Jalingo LGA, Taraba State Nigeria. Mediterranean Journal of Social Sciences, 5(10), 82-88

[46]. Palmquist, R. B. (1992). Valuing localized externalities. Journal of Urban Economics, 31(1), 59–68.

[47]. Peter, N. J., Ayedun, C. A., and Iroham, C. O. (2018). Registration into associate membership status of the Nigerian institution of estate surveyors and valuers (NIESV): The challenges. International Journal of Civil Engineering and Technology, 9(10), 1239-1251

[48]. Popoola M. O., Abiola S. O., and Adeniji, W. A. (2013). Traffic congestion on highways in Nigeria causes, effects and remedies. International Journal of Civil and Environmental Engineering, 7(11), 858-863

[49]. Rao, A. M., and Rao, K. R. (2012). Measuring Urban Traffic Congestion – A Review. International Journal for Traffic and Transport Engineering, 2(4), 286 – 305

[50]. Ukpata, J.O. and Etika, A.A. (2012). Traffic congestion in major cities of Nigeria. International Journal of Engineering and Technology, 2, 1433-1438.

[51]. Wilhelmsson, M. (2000). The impact of traffic noise on the values of single-family houses. Journal of Environmental Planning and Management, 43(6), 799–815