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ASSESSMENT OF INTRA-CITY ROAD INFRASTRUCTURE IN ADO-EKITI, EKITI STATE, NIGERIA

[1]ARUNA K. K., [2]OYINLOYE M. A., [3]SULAIMAN, D. K.

[1] Department of Urban and Regional Planning, The Federal Polytechnic, Ado Ekiti; [2]Department of Urban and Regional Planning, The Federal University of Technology, Akure; [3]Department of Estate Management and Valuation, The Federal Polytechnic, Ado Ekiti.
E-mail: seemjournal@fedpolyado.edu.ng

Abstract

The development of the nation's overall growth is directly impacted by the vital substructure of the transportation system. A substantial number of developing countries experience issues with road transportation, including limited and low-quality infrastructure. The study assessed intra-city road infrastructure in Ado-Ekiti, with a view to identifying its adequacy and functionality for efficient transport in the town. To this end, the study examined locations of the road infrastructure, characteristics of the road infrastructure, and condition of the road infrastructure. A systematic random sampling method was adopted to select respondents for the study. Data were sourced from both primary and secondary sources. A 2.5% of 20,160 households amounting to 503 households was used as the sample size. Data analysis was based on responses from 500 questionnaires retrieved, and the data were analyzed using descriptive statistics. The results of this study showed that based on the locations of road infrastructure, disparity exists in the distribution of infrastructure amongst the major roads. Inferences from the results gathered also demonstrated that the infrastructure that is available is very much less than the non-available infrastructure. About 50% of the respondents are satisfied that the condition of road infrastructure in Ado-Ekiti is fair. The study's recommendations for the Ekiti state government include quantifying the number of existing road infrastructure, establishing a state maintenance board to expedite their renovation, and diversifying its goals for providing road infrastructure through public-private partnership (PPP) agreements with the private sector.

Keywords: *Road transport, Intra-city, Infrastructure, Location, Availability, Condition.*

1.0 Introduction

The transfer of products and services from a point of origin to a desired destination is referred to as transportation. In order to facilitate the movement of people and commodities as well as the production and distribution of services, the transportation industry is necessary (Brain and Richard, 2000). As a result, transportation serves one of the most crucial purposes and is one of the most ubiquitous activities in any society or economy. Taube (2013) asserts that "There is hardly any human society or human settlement that can efficiently and effectively function without adequate, reliable, and affordable transport system" as evidence in favor of this.

The effectiveness and efficiency of any transportation system are determined by its infrastructure and services (Ocholi, 2013). Infrastructure is the underlying ground or prerequisite for the social and economic activities of an organized society. Transport infrastructures are important auxiliary structures whose development directly affects the entire development of the country (Braconier, Pisu, and Bloch, 2013). The main instruments for advancing economic and strategic development are infrastructures.

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According to Oni and Okanlawon (2008), the transportation infrastructure is the main building block of the system that offers transportation service and operation. In Nigeria, the road transport system is a crucial component of the transportation sector. From the place of origin to the target destination, it is the most common form of transportation for people, commodities, and services, with the only advantages being time and value chain. Nigeria's roads are in poor condition due to a variety of factors ***(Odugbemi, 2010).*** He observed that faulty designs, poor drainage, thin coatings that were easily washed away, excessive use of the road network, given the underdeveloped state of waterways and railroads, which could serve as alternative modes of transportation, absence of an articulated road program, and insufficient funding for road maintenance were some of the reasons why the state of roads has deteriorated. Having a sufficient, dependable, and effective transportation system is essential for the growth of the local economy. The efficient operation of the manufacturing, retail, labor, and housing markets is dependent on a well-developed road transportation infrastructure, which in turn provides enough access to local communities (Olubemehin, 2012).

Ekiti State, since its founding in 1996 has had rapid development in both its population and economic activity (Oyinloye, 2014). The National Bureau of Statistics estimates that there are 3.3 million people living in Ekiti State as **at** 2016. Along with this increase, Ado-Ekiti expanded tremendously, which raised social and economic activity levels. These have resulted in the urban sprawl, increased traffic, longer travel times, higher transportation costs, and longer waiting times for workers in the area, putting further strain on the infrastructures that are already underdeveloped.

One of the states in Nigeria with highways built by the federal, state, and local governments is Ekiti State. According to Bankole (2006), there are significant inequities and discrepancies in the distribution of the region's road infrastructure.

The geospatial assessment of the intra-city road infrastructure in Ado-Ekiti, Ekiti State, Nigeria is the primary emphasis of this study**,** in light of the aforementioned with specific interest in the condition, characteristics, and location of such roads infrastructure which includes the sidewalks, drainage, surface condition, bridge, speed breakers traffic lights, road signs, bus-stops, lay-by etc.

2.0 Literature Review

Adepoju (2021), believed that there was a gap between the anti cipated and actual life spans of Nigeria's roads after they were put into service. The study emphasizes that money, user issues, ero sion, lack of experienced workers, capital for equipment, and machinery upkeep are some o f the difficulties in building new roads. Road crashes (27%), high vehicle maintenance costs (21%), capital flight (17%), passenger discomfort (14%), high transportation costs (11%), and driver weariness (10%) are among the consequences of poor roads. Famakinwa (2019), while examining the urban road transportation infrastructure in Owo, Ondo State, Nigeria, noted that the main obstacles to road transportation were the lack of amenities like lay-bys, traffic signs, street lights, roadside drainage, speed breakers, pedestrian crossings, side kerbs, control mechanisms, culverts, and smooth road surfaces. The study appropriately provided recommendations for achieving efficient transportation infrastructure. Zhang and Cheng (2023), investigate the relationship between transport infrastructure development and economic growth in the UK over different time spans using principal component analysis. Empirical results suggest that transportation infrastructure has a long-run positive effect on economic development. However, in the short run, this effect turns out to be significantly negative. Gambiyo (2021) looks at the

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infrastructure of road transportation as it stands, focusing on travel options and how these affect operating costs. The findings of the marginal effects demonstrate how transportation choices, personal preferences, and operating expenses are all impacted by deteriorating terrain. This affects the cost of transactions, agricultural production, and transportation costs. Olorunfemi (2021) conducted research on the performance assessment of road transport infrastructure in selected urban centers in Kogi State, Nigeria. In order to get information on how urban dwellers felt about the condition of the road infrastructure, 1,215 household heads from the chosen urban centers were chosen. The results showed that disparity exists in the provision of road infrastructure provided in the study area's selected urban centers. Respondents, who are residents of the city, expressed dissatisfaction with the state of the road network but moderate satisfaction with the state of the drainage system, the street light, the traffic sign, the walk-way, and the availability of parking spaces. Ogunleye and Ibitoye (2005), stated that the poor condition of Ado-Ekiti's major and secondary roads was one of the contributing elements to the city's mobility issues. Specifically, the Ikere-Old Garage-Okesa-Fajuyi-Opopogboro Road, the Textile/Basiri Road, the Irona/Isewe Road were selected with the purpose of looking at their characteristics.

Majority of the pedestrian walkways along the city's highways were either absent or in poor shape, which led to walkers battling with drivers for the right of way, which was too narrow for just vehicular traffic. Due to aging and a lack of maintenance culture, all the roads under investigation were tarred some decades ago and were in terrible shape. Therefore, in the light of the foregoing, this study seeks to access intra-city road infrastructure in Ado-Ekiti, Ekiti State with particular interest in the location of road infrastructures, whether they are evenly or unevenly distributed, their characteristics and the condition of these road infrastructure.

3.0 Materials and Methods

3.1 Study Area

The Ado-Ekiti region can be found between latitudes 7º32¹ and 7º40¹ north of the equator and between latitudes 5º6¹ and 5º25¹ east of the Greenwich Meridian. There are several nearby satellite towns. Iworoko is located approximately 16 kilometers to the north of the heart of Ado; Are and Afao are about the same distance to the east; Iyin and Igede are about 20 kilometers to the west; and Ikere is about 18 kilometers to the south. Since Ado-Ekiti is almost in the middle of the state, it has the advantage of being a nodal town, where routes leading to various regions of the state intersect (Aladelokun, Ayodele, & Oluwatuyi, 2020). The study focuses on Ajilosun/Ajebamidele road, Odo-Ado/Polytechnic road, Irona/Isewe road, Bank road, Textile/Basiri road, Similoluwa/Adebayo road, Okeyinmi/Oke-ila road in Ado-Ekiti as shown in Figure 3. These roads are the intra-city roads that leads directly to other towns and are facing many challenges relating to road infrastructure. The study involves both pilot and complete surveys in assessing intra-city road infrastructure in Ado-Ekiti, Ekiti State. A pilot survey was conducted to gather preliminary information regarding the location of road infrastructure. The identified infrastructure such as drainage, walkway, traffic lights etc. were symbolized and a geospatial database created for decision making purposes. The complete survey was conducted to collect data on the conditions and characteristics of road infrastructure in the study area.

3.2 Research Methodology

For the purpose of data collection, major roads in seven areas in Ado-Ekiti were purposively selected out of all the roads in Ado-Ekiti and a building demographic survey within the buffer of 200m on each side of the roads under study

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was carried out using GIS digitized Google Earth Imagery device to arrive at 5,040 buildings. The total number of buildings within the buffer constituted the sampling frame which is a total of 5,040 buildings. As observed and pointed out by Fasakin (2000), It is estimated that the average family size in Nigeria is seven (7) and the average number per building is four (4). This implies that there were about 20,160 households in the study area. Since there are no hard and fast rules about picking sampling size, a 2.5% of the estimated households amounting to 503 persons was served with questionnaire. According to Neuman (1991), larger populations permit smaller sampling ratio for equally good samples. The chosen sample size of 2.5% was large enough to allow generalization to be made on the results that was obtained and it is reasonable based on suitability, land area, and homogenous characteristics of the study area. Systematic random sampling was adopted to serve questionnaires. Household heads in every 4th house were selected from the buildings in order to eradicate any form of bias. Data presentation and analysis were made in tabular form and the frequency of respondent's responses were calculated in percentages.

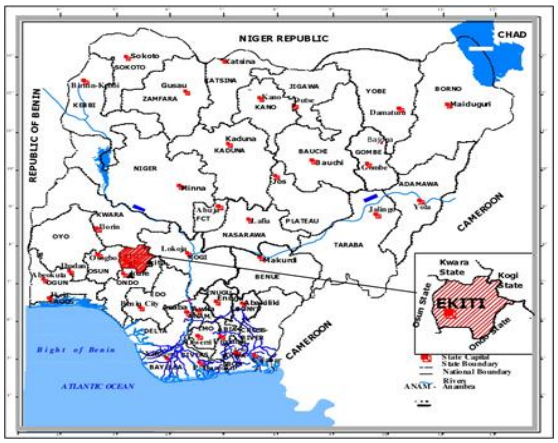

Figure 1: The study area in its National setting
Source: Ekiti State Ministry of Land, Housing& Urban Development, Ekiti State

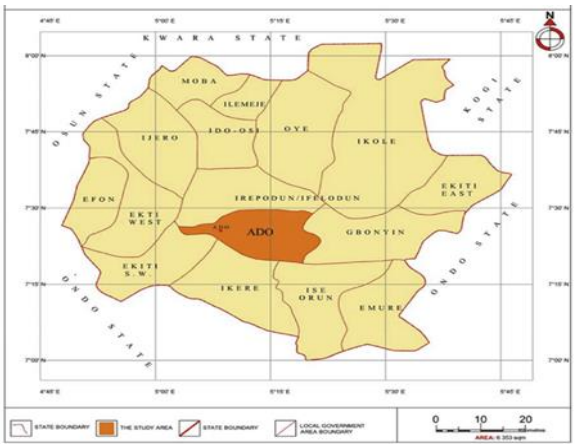

Figure 2: Ado Ekiti in its Regional setting.
Source: Ekiti State Ministry of Land, Housing & & Urban Development, Ekiti State.

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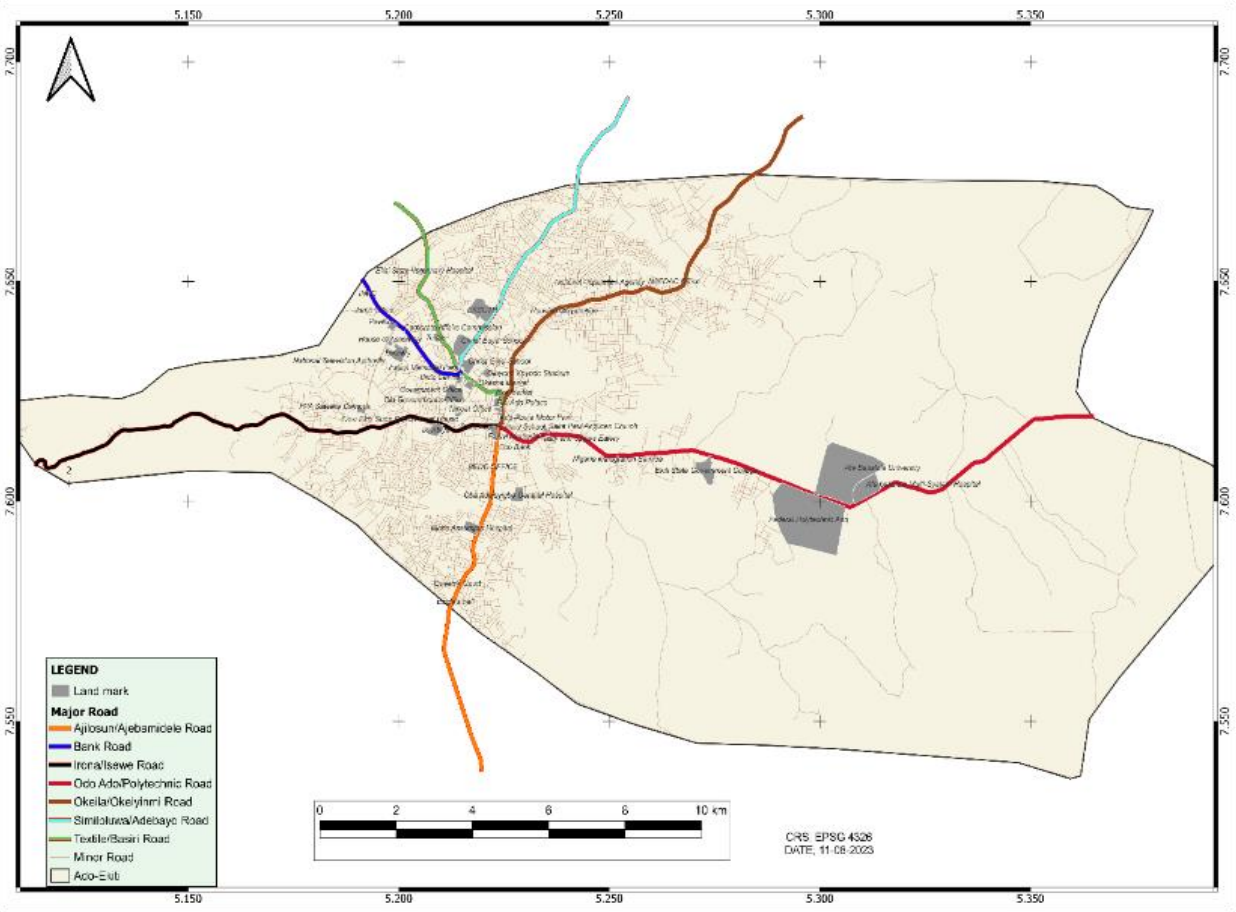

Figure 3: Major Intra-city roads in Ado-Ekiti.
Source: ArcGis 10.5(Digitized by the author)

Table 1: Road Characteristics by Respondents

Variables		Frequency	Percentage
Roads	Ajilosun/Ajibamidele	74	14.8
	Odo Ado/Poly Road	92	18.4
	Irona/Isewe	85	17.0
	Bank Road	28	5.6
	Textile/Basiri	45	9.0
	Similoluwa/Adebayo	76	15.2
	Okeyinmi/Oke Ila	100	20.0
	Total	**500**	**100**

Table 1: Reveals Road Characteristics by 500 Respondents.
Source: Author's Fieldwork, 2024

4.0 Results and Discussion

4.1 Location of Intra-City Road Infrastructure in Ado-Ekiti.

As revealed in Figure 4, the distribution of road infrastructures in the major roads in Ado-Ekiti shows that disparity exists among the roads under study. A close examination of the figure below, reveals that Bank Road was most advantaged showing the most infrastructure ranging from drainage, sidewalks, zebra crossing, road markings,

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bus-stop, street-lights, etc., and was only disadvantaged by lay-by while Odo-Ado/Poly road and Oke-Ila road appears to be the most disadvantaged, with drainage and speed bumps as the only available infrastructures.

Analysis on Figure 4, further shows that in textile/Basiri road, road infrastructure are fairly adequate and are disadvantaged only by roundabout, lay-by and zebra-crossing, whereas in Similoluwa/Adebayo road, the road is disadvantaged with road infrastructures such as zebra crossings, lay-by, bus-stops, road signs, and road markings. Also, Irona/Isewe road was disadvantaged in sidewalks, zebra crossing, bus-stops, lay-by, road signs, and road markings infrastructures. While in all of the roads, lay-by was generally not present and drainage was the most available infrastructure. This implies that, road infrastructure are not adequate and there is need for government's intervention in supplying adequate road infrastructure. The geospatial analysis also shows that there is a significant difference in the location and distribution of road infrastructure across the major roads in Ado-Ekiti.

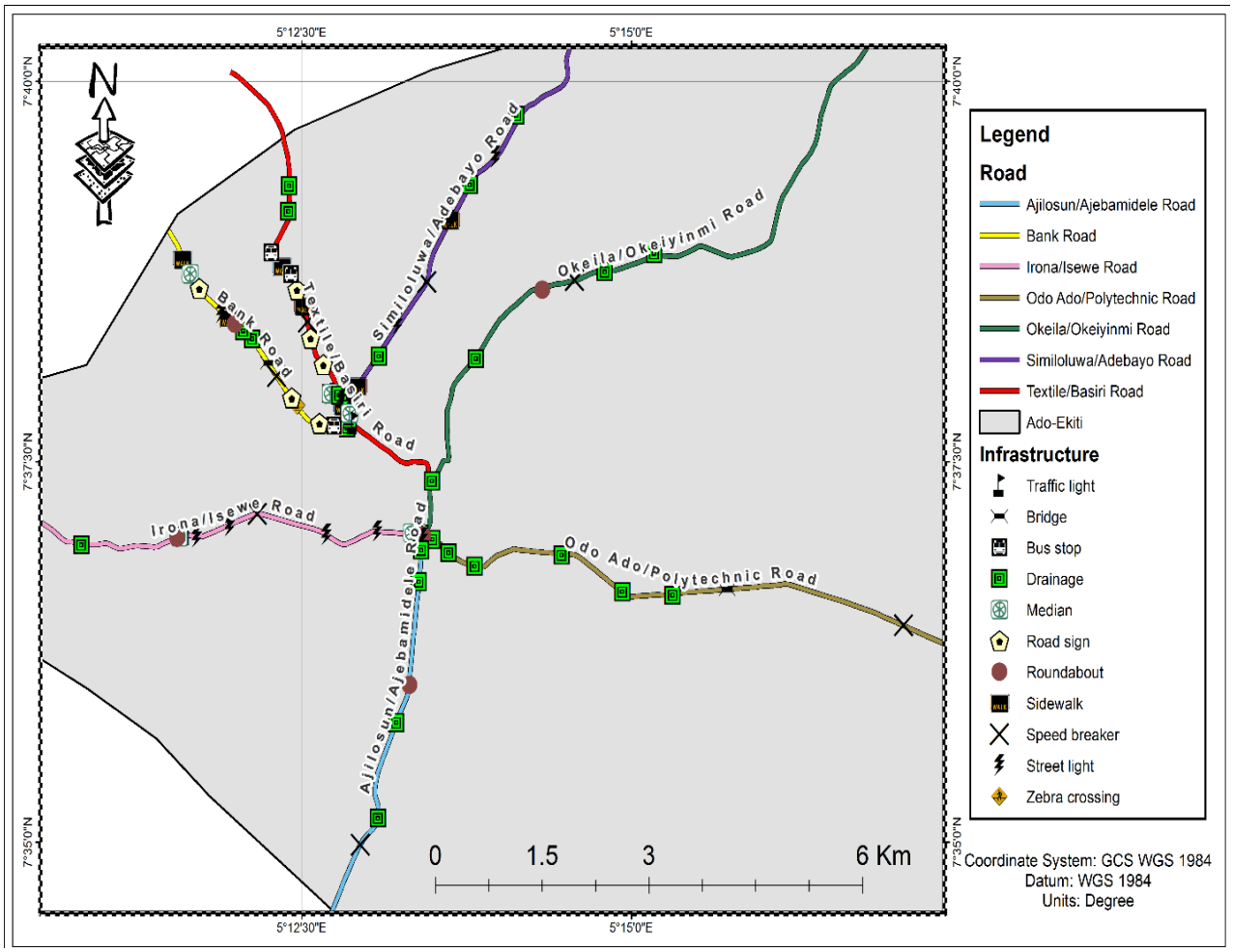

Figure 4: Location of selected road infrastructure in Ado-Ekiti.
Source: ArcGis 10.5 (Digitized by the Author, 2024)

4.2 Examine the Characteristics of Road Infrastructure in the Study Area

Ado-Ekiti is not an exception to the rule that socio-economic progress in Nigeria

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only extends as far as road infrastructure allows. Simply put, connecting implies growing. The necessary road infrastructure must be built in order to support the economy's current rate of growth and development. An analysis of respondents' perceptions of their knowledge of the Ado-Ekiti area's road infrastructure was made. Table 2 depicted respondent's opinion on the availability of road infrastructure in Ado Ekiti. The result reveals that 66.6% of the respondents believed that Tarred Road is available, while 33.4% says that Tarred Road is not available. Further analysis shows that, 43.6% of the respondents indicated that street light is available, while 56.4% strictly affirmed that street Light is not available. Also, inference from table 2 shows that 49.6% of the respondents believed that drainage is present, while 50.4% opined that drainage is not present. Furthermore, 21.6% of the respondents says that zebra crossing is available, while 78.4% affirmed that zebra crossing is not available. Moreover, 7.0% of the respondents believed that lay – by is available, while a large sum of 93.0% claimed that lay – by is not available. Also, 32.0% of the respondents believed that bridge is available, while 68.0% affirmed that bridge is not available. Finally, from the result, inferences could be made that the available infrastructures are very much less when compared to the non-available infrastructure. Therefore, we could conclude that there is need for the provision of adequate road infrastructure in Ado-Ekiti.

Table 2: Respondents Opinion on Characteristics of Road Infrastructure in the Study Area

Item	Available	Not Available	Mean	SD
Tarred Road	333	167	1.33	0.472
	66.6%	33.4%		
Street Light	218	282	1.56	0.496
	43.6%	56.4%		
Side Walks	183	317	1.63	0.482
	36.6%	63.4%		
Drainage	248	252	1.50	0.500
	49.6%	50.4%		
Traffic Lights	209	291	1.58	0.494
	41.8%	58.2%		
Road Signs	178	322	1.64	0.479
	35.6%	64.4%		
Road Markings	178	322	1.64	0.479
	35.6%	64.4%		
Median	224	276	1.55	0.498
	44.8%	55.2%		
Speed Breakers	329	171	1.34	0.475
	65.8%	34.2%		
Zebra Crossing	108	392	1.78	0.412
	21.6%	78.4%		
Roundabout	283	217	1.43	0.496
	56.6%	43.4%		
Lay – by	35	465	1.93	0.255
	7.0%	93.0%		
Bridge	160	340	1.68	0.467
	32.0%	68.0%		
		Total	**20.59**	**6.01**
		Grand Mean	**1.58**	**0.46**

Source: Author's Fieldwork, 2024

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4.3 Assess the Condition of Road Infrastructure in the Study Area.

Ado-Ekiti's constantly growing population puts tremendous strain on the region's infrastructure, notably the transportation system (Ogunleye and Ibitoye, 2005). Majority of the people rely heavily on roads for daily transportation. The age of the roads, the constant use of the roads, in combination with haphazard or occasionally near-neglectful maintenance, result in rough surfaces and potholes, which cause human discomfort, lost man hours, increased vehicle repair costs, vehicular accidents, and the loss of life and property, among other things. The result on Figure 5 reveals that out of 500 respondents; 50% are of the opinion that road infrastructure in Ado-Ekiti are in fair state, while, 26.2% representing 131 respondents attest that road infrastructure are in good state. So also, similarly 15.8% believes that they are in poor state, while the remaining 6.6% respondents are of the opinion that the states of road infrastructure are very poor. Also, 1.4% of the respondents says road infrastructure are in excellent state. The insights from the result implies that the state of road infrastructure in Ado-Ekiti is fair. Therefore, there is need for an effective functionality, optimum maintenance and rehabilitation of road infrastructure to serve its people maximally.

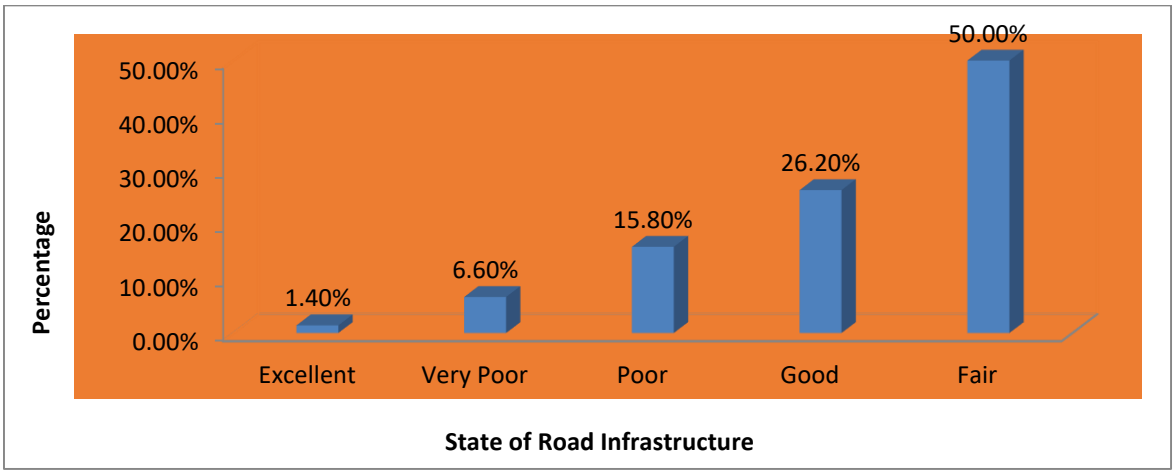

Figure 5: Respondent's Opinion on the State of Road Infrastructure in Ado-Ekiti
Source: Fieldwork, 2024

5.0 Discussion

In this research, attempts were made to undergo an assessment of intra-city road infrastructure in Ado-Ekiti, Nigeria. Issues relating to location, availability, and conditions of road infrastructure such as the sidewalks, streetlights, traffic lights, road signs, road marking, median, zebra crossing, round about (intersections), lay-by etc. in Ado-Ekiti were assessed. As revealed in Figure 4.8, the distribution of road infrastructure in the major roads in Ado-Ekiti shows that, disparity exists among the roads in the study area. The study revealed uneven distribution across the study areas in the provision of various types of road infrastructure in Ado Ekiti. This is in alignment with Olorunfemi (2021), in his study, that disparity exists in the provision of road infrastructure provided in the study area's selected urban centers. A close examination reveals that Bank Road was most advantaged showing the most infrastructure ranging from drainage, sidewalks, zebra crossing, road markings, bus-stop, street-lights, etc., and only disadvantaged by lay-by while Odo-Ado/Poly road and Oke-Ila road appears to be the most disadvantaged, with drainage and speed bumps as the only available infrastructure. Generally, the study revealed that condition of the available road infrastructure in Ado-Ekiti

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is fair as opposed to been adequate to serve the city's inhabitant. This is in the light of the study of Ogunyemi and Ibitoye (2005), which stated, that the poor condition of Ado-Ekiti's major and secondary roads was one of the contributing elements to the city's mobility issues.

6.0 Conclusion and Recommendations

The study concludes that road infrastructure plays a crucial role in the socio-economic development of every country, in that, it ensures smooth movement from one point to another. All the empirical evidence inherently assessed in this research describes the level of road infrastructure to be below standard. However, government intervention are necessary for proper planning, provision and maintenance of road infrastructure as whole to enliven the study area. In view of these, the following recommendations are made; the administration of the state of Ekiti should work to determine how many road infrastructure are now in place and set up a state maintenance board to quickly repair them, the government should diversify its goals for the provision of road transport infrastructure by entering into public-private partnership (PPP) agreements with the private sector to renovate existing and build new road infrastructure, government should introduce strict policies and regulation systems on charges against motorist mis-using road infrastructure to raise additional funds for maintenance of dilapidated road infrastructure, local government must as a matter of constitution relief burden of road construction, rehabilitation and maintenance by the Federal and State Governments.

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