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Road Infrastructure and Urban Development in Akure, Nigeria: "Performance Indices and Sustainable Development"

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Abstract:

Transport is essential to the functioning of any society and road transport in particular plays a significant role in the economic growth and physical development of the urban Centre's as well as transport furniture and safety aid in their surrounding regions. Road transport infrastructure influence the location and range of productive and leisure activities, it affects the location of commercial business and residents; it influences the range and provision of goods and services available for consumption. It inevitably impacts on safety, movement travelling time and quality of city life.

The paper examines the models that describe the internal structure of Akure city and its urban road infrastructure development and performance indices, its sustainable management development with comparison of old Akure in the 19th Century and the new Akure metropolitan of 21st Century, and recommends the needs for the extension of road construction and expansion to other area of the city. The provision of functioning road traffic light at various junctions and the need for professional skilled manpower to manage the road information furniture's and waiting bus stop shades for neatness and maximum utilization, public enlightenment on usage, policy formulation, rules and regulations for both users and operators.

Keywords*: Road Expansion, Infrastructure, Traffic Signal Information and Safety Management.*

Introduction

Life without adequate infrastructure is meaningless. In the beginning, God Almighty viewed the necessity of providing a suitable infrastructural environment for man, to make a living environment suitable within the earth form. God created the sun – as source of energy; the moon and stars for light in the night; the sea, rivers, and streams as source of drinking water; transportation and relaxation; land for agriculture and mineral resources (both underneath the land and in the sea); and sky to support; and also means of economic development for human existence and convenience. *Genesis 1:3, 9, 10, 14, 16, 31 and Genesis 2:10-14.*

Eventually, when man multiplied and began to live in cities, road infrastructure and urban development became very crucial to their daily survival. Biblically, God Almighty told the children of Israel to remove human and domestic waste and bury them outside their camps (habitation) before he could walk in their midst (In Deuteronomy 23:13-14) . This appears as an instruction on our sanitary landfill, effective method of solid and waste disposal for our contemporary urban setting. Over the years, men have continuously recognized the impact and role which road infrastructure plays in urban development and its location. Cities, kingdoms and empires derived their greatness on the account of their road infrastructure; favorable locations based on availability of one or combination of natural infrastructure like rivers, and lagoons; and railways with modern equipment for operations and usage.

In our contemporary world, most notable urban cities are located on or near river courses, harbors, estuaries, lagoons and sea-fronts (*Robinson 1973, Huds 1976 an Morgan 1952).* From the beginning of history, man's sensitivity has revealed an urge for mobility, leading to a measure of economic impact of society's progress. The provision of appropriate and effective road facilities is of the utmost importance in order to achieve well-functioning roads in terms of road safety, capacity, user comfort and minimized environmental impact *(OWI group, 2011).* Movement within urban environment is dynamic and is the main factor in urban life. It is the prolonging element for all social, economic and cultural activities in cities *(Khashayar, 2011).* The role of transport in our daily activities cannot be over-emphasized and without it, the necessities of life would be difficult to achieve. The basis for trip generation rests on the locational structure of different but complementary activities which are variedly located in space. Land use activities

therefore, have an impact on transport, hence, the concept of spatial interaction is very important in the study of relationship of phenomena in space.

Ultman (1956) postulated three concepts which are complementary, intervening opportunity and transferability. In the same vein Daniels and Warnes (1983) explained the patio-temporal relationships that exists between transport and urban growth. They identified four distinctive phases. The first phase is the Pedestrian city which represented the situation where the only means of transport was by foot. Commuters could only make trips to wherever they could conveniently walk to while the second phase shows the introduction of horses, bus and train way. The city under this stage remained compact and concrete because the two forms of transport system did not adequately solve the mobility requirement of the urban dwellers. The third phase witnessed the development of railway and bus transport which led to decentralization of Central Business District (CBD) and the creation of secondary CBD along sector structures. The arrival of cars and other forms of personal transport in the fourth phase confers different accessibility advantages on intra-urban locations while at the same time making possible the access and appearance of new land uses. This theory therefore explains and shows that the more complex the transport system which the city requires.

The emerging trend of new cities in Nigeria shows that initially, there was rural-urban migration. This migration swelled population of the city centre and its immediate concentric zones. As more people leave the country side to the city, the centre increase. This development led to the periphery as it became costly to live in the centre of the city. In Nigeria, according to various reports and accounts is urbanizing at astonishing pace and rate *(World Bank, 2012).* The progress of urbanization has been put at 20% in 2012 *(World Bank, 2012)* and at the current rate of 5.6% annual growth rate, will cause urban population to double by 2025. The frightening growth profile presented above has been taking place against a weak and disappearing Transport Infrastructural Base. The challenges and problems posed by the rapid urban growth in Nigeria are immense, frightening and perhaps more easily observable are the transportation and movement, general human needs and environmental poverty. This environmental poverty is revealed in forms of overcrowding, traffic congestion , massive solid waste generation, inadequate water and power supply, urban violence, homelessness and street gangsters - "the area boys phenomenon" *(Fasakin, 1985)*

In view of this trend this paper examines the road infrastructure and urban development phenomenal in Akure with a view to determining the performance indices sustainable development.

The significant of the impact of road infrastructure on urban and city development :

It is noted that it is a daunting exercise to characterize city by city the state of infrastructure in Nigeria. Authors agreed that without exception, infrastructure in our cities are in an appalling situation. Adebiyi and Adeoye, (1997) stated that Nigerian Urban infrastructure have fallen into a deplorable state of disrepair. Urban infrastructure are not only lagging behind in meeting up with the rate of urbanization, established Transport infrastructure is gradually collapsing over time. Road infrastructure and urban structure development and city management are characterized by inadequate adaptation of inappropriate standards, poor and un-sustained maintenance, disjointed administrative framework and uncoordinated efforts. This has hunted the cities in Nigeria with the fear that these cities may die from a combination of uncontrollable urban migration growth and poor transport dismal infrastructural endowment. The important role of transport infrastructure in the urban development in the economy of any nation or city is a complex one. It has both positive and negation effects. Among which are:

- Transporting and movement options
- Promotion of trade and commerce by providing opportunities for economic interactions to occur unhindered.
- Creation of an endless list of jobs and employment opportunities
- Generation of huge revenue for the government and other formal and informal stakeholder operating in the transport sector.
- Acceleration of urbanization as well as redirecting spatial growth and by implication, contributes positively to population growth.
- Encouraging institutional development and growth
- Exertion of economic scales and multiplier effect
- Supporting of international relations and peaceful co-existence
- Encouraging of socio-cultural relationship and understanding

Given the important roles associated with the transport (road) infrastructure, it has become imperative to provide road infrastructure for urban development and city management to ensure that population is adequately provided for, with sustained and functional mobility modes, so that it can respond to the dynamic nature of the city and its population especially those relating to mobility, trade, and commerce.

An overview of road infrastructure and urban city development

Over the ages, men have continuously recognized the crucial role which road infrastructure play in settlement location and mostly in urbanization of cities. Great cities, kingdoms and empires prospered on account of their favorable impact

based on availability of combination of element which plays a key role in the traffic flow of urban development that aid inter-urban movement of goods, passengers and services. Clearly road transport has an important role in economic, social and cultural functioning of cities. The fundamental problems of inadequate and inefficient infrastructure are essentially, phenomena associated with the development of urban cities.

Developed countries have achieved "unobtrusive and efficient ways" of providing and maintaining road infrastructure in their cities. However, it is debatable, if all road infrastructures in the cities in industrial societies are well endowed with good road features and infrastructure. In many cities today, it is generating significant social and economic costs. These costs arise from the effects of traffic systems due to inadequate road street furniture which often times cause to accidents, congestion, and consumption of public space, air pollution, noise and disruption of social and economic interaction World Housing Organization *(WHO, 2009)*. Roadway safety is a key element of transportation and urbanization. They stressed that neighborhood roads, traffic calming, safety barriers, pedestrian crossing and cycle lanes can as well protect pedestrians and cyclists. Some road features such as road signs and fire hydrants are designed to collapse .For major roads, risks can be reduced by providing limited access from properties and local roads, grade separated junctions and median dividers between contra-flow traffic to reduce likelihood of head-on collisions. Light poles are designed to break at the base rather than violently stopping a car that hits them. Identifying dangerous situation on roadways, determining what factors affect safety and looking for appropriate solutions to ultimately improve overall roadway safety are essential tasks of transportation professionals.

Methodology

Data Sources can be classified into two major areas: These are Primary and Secondary sources. Primary sources which include direct observation, mail, questionnaires and personal interviews *(Nwachukwu, 2005)*, the initial data from physical and direct observation, the photos of which could be the key factors, while secondary sources refers to data from documents. There is no doubt that some urban cities are made with series of efforts and huge transport infrastructure and street furniture to accommodate movements, the pathways and road, and information features like light that are utmost important elements in forming urban center.

Evaluation of the effect of road infrastructure on the performances of motor able agencies on urban development, Safety and traffic controlled was carried out through descriptive and survey research design. According to Mbahi (2001) descriptive and survey research designs are concerned with the collection of data for the purpose of describing and interpreting the existing conditions prevailing practices, beliefs attitudes and on going process among others.

The research population of this study consisted of government Agencies, The community / users and the road enforcement officers.

Research Instruments: - The instruments used for this study were: - A questionnaire for the three (3) groups were used which consisted a set of Thirty (30) multiple choice test items designed to reveal the basic reality and relationship between the road infrastructure and the Urban development, the road infrastructure and the communities / users or operators both vehicle and pedestrian and also the show the impact of the road enforcement officer on the management and control of traffic. The questionnaires were administered to the three selected population and Site observation with selected interview were conducted, it elicited information concerning the perceptions of the users and the impact of the road furniture's on safety and Traffic control.

The instrument was personally administered by the researcher and as well as some research assistants, hence the 100% rate of return.

The data collected was analyzed based on the research question that guided the study, which were (i) Impact of road infrastructure on urban cities, (ii) Impact of road infrastructure on traffic control and management, congestion and reduces of accident and turn around time, (iii) Impact of road marking and traffic light, street light, road signs, bus-stops on urban development and its management by road enforcement officer.

Since this study is site - specific study the data was site specific and the results of the processed data constitute the basis of the finding (as reported) and which the recommendation was based.

It is partly for this reason that this research work examined the factors that may be responsible for this infrastructure performance indices and its sustainable development in Akure City.

FINDINGS

Many factors have been identified as critical contributing elements to roadway safety in urban cities incidents including driving errors, poor roadway conditions or bad weather and lack of adequate street/road furniture.

(a) Road development and its impacts

Nigeria is not an exemption to the development of road mode of transportation in Nigeria which accounts for more than 90% of sub-sector of economy and 5% contribution to

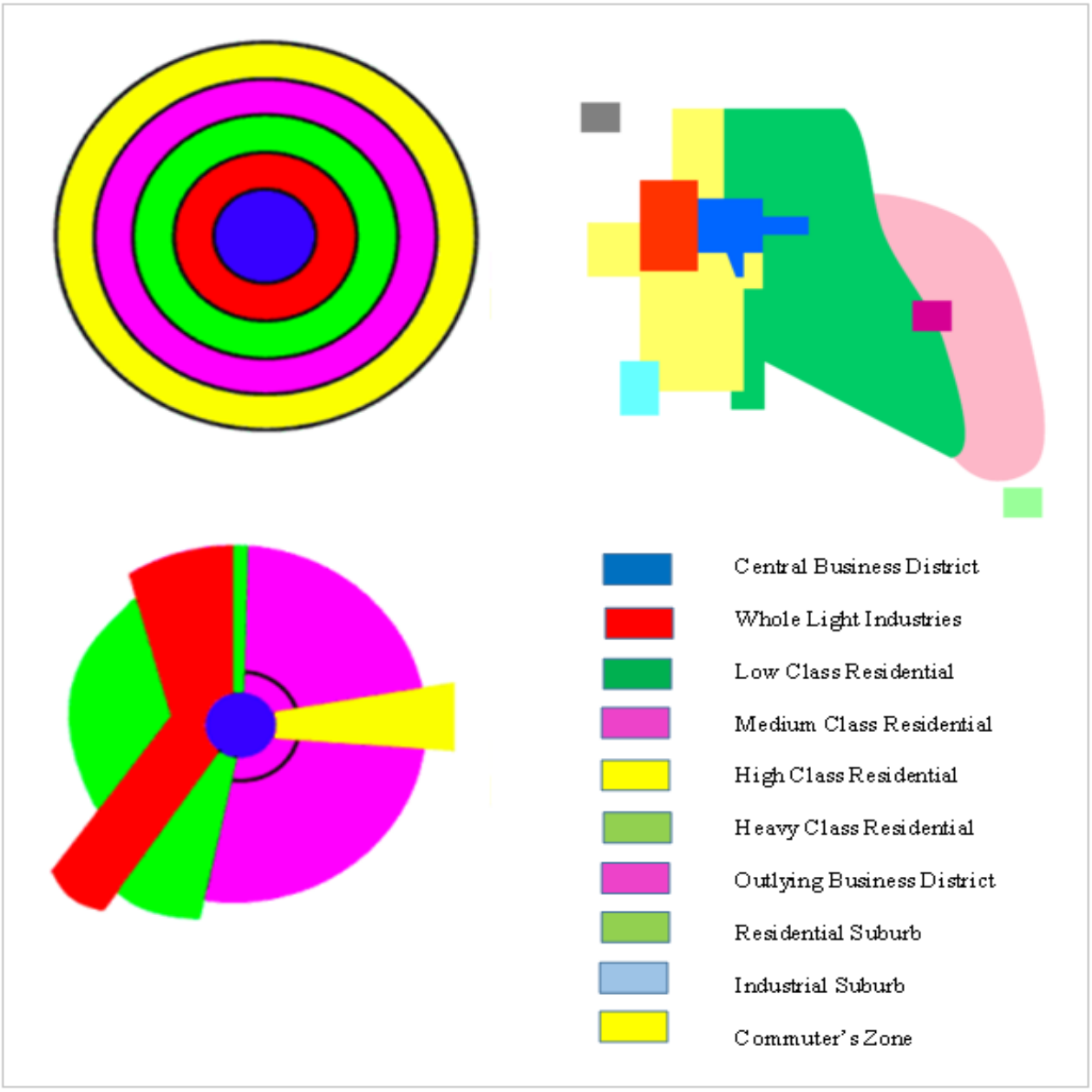
the Gross Domestic Product. In Akure, the community distance increased from 5.2km in 1996 to 6.4km in 1976, 10.5km in 1985, 13km in 1996, and 19km 2006 (Ogunbodede, 2006) has now become 40km in 2014 and it is expected to rise to 60km in 2020 (Owoputi, 2016). The increase in commuting distance has impact on trip attraction; fare paid by commuters and it also shows the need for different modes of transportation.

(b) Spatial pattern and Akure road development

Ways of mitigating these mobility problems and ensuring a smooth flow of urban traffic has been carried out in different studies as exemplified by the works of urban transport scholars. Ogunsanya (1987) and others were pre-occupied with various options for solving transport in our daily activities, it has been noted to possess "Myriad of negative effects". This is why Clark (1958) described transport as the Maker and Breaker of cities and Ogunsanya (2002) also reiterated what Clark observed and confirmed it. A major influence of transport on sector theory is discernable on the landscape produced unlike the concentric pattern where the land use concentrates on the CBD. People located their establishments along the road sides as much as possible, as they want to take advantage of vehicular transport (Bello 1993).

The involvement of the transport factor in the spatial growth of Akure can be said to have rigidly followed the process explained in the theories above. However, the extents to which the theories are applicable to Akure have been discussed by Ogunbodede (2006) observed that what existed in Akure was not a complete concentric structure of urban settlement but a concentric multinuclear structure and that the introduction of modern transport technology in the twentieth century has led to a sectorial form of development in Akure.

Different Model of the internal structure of Cities



Findings and Conclusion

At a time, the urban land use in Akure was dominated largely by residential areas. Because city form was concentric and compact, trip lengths were short, intra urban movement were thus mostly between the different residential quarters and between the quarters and the Oba palace and market area which was the center of commercial, recreation and festival activities.

The Old Akure Town before 2010, there was neither road expansion nor transport information furniture's for Vehicle user's and road users safety.

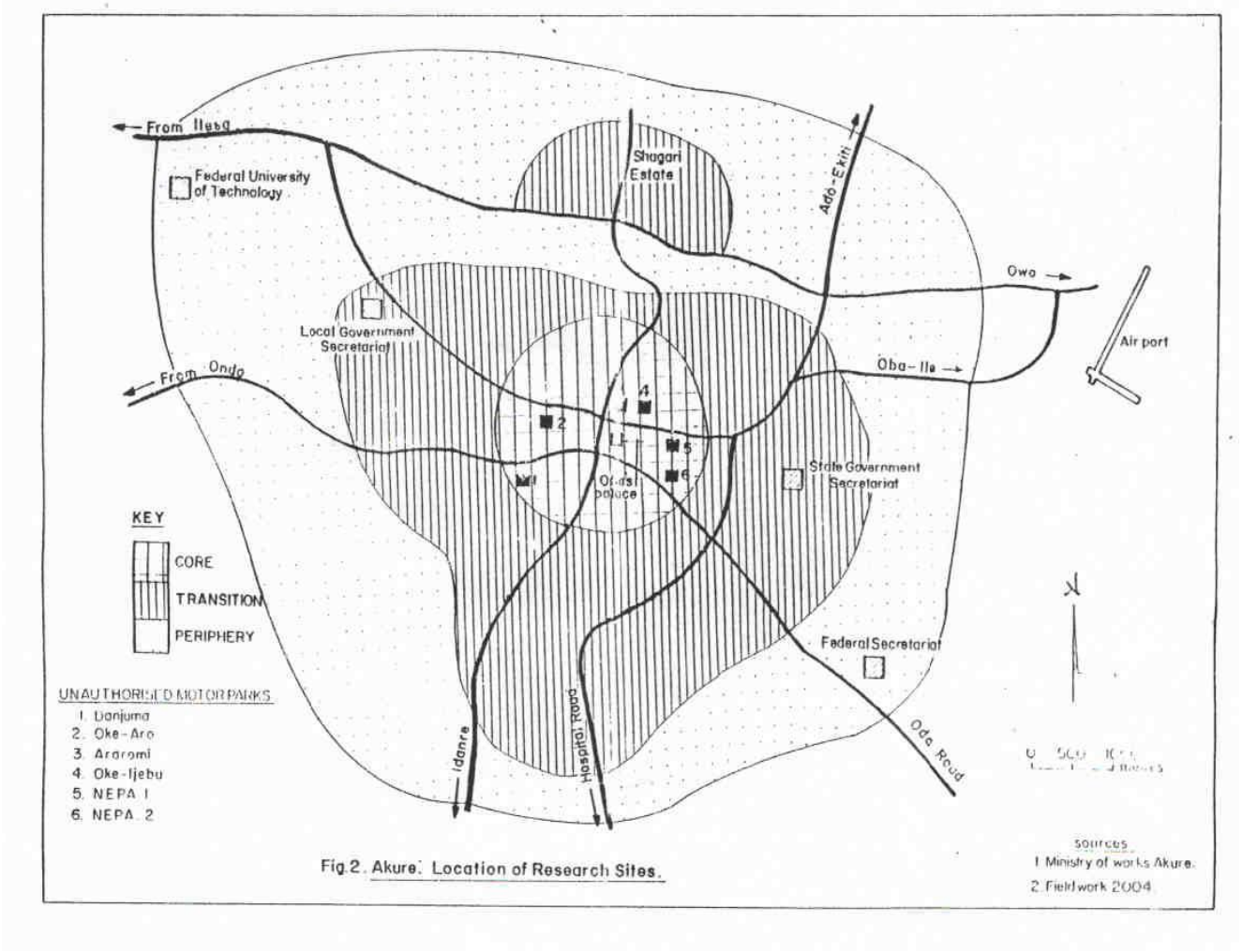


Figure 1 Old Akure Town

Oyeleye (2001) recognized that economic and social factors encourage a city's area expansion. He stressed that industrial revolution and Improvement in agriculture have made great contribution in this respect. The new era of political development with allocation of revenue to oil producing states made a great impact in the urban and city transportation infrastructure and roads to take prominent position on investment. The action of government sometimes contributes to the development of road infrastructure in the urban cities as an act of the government to promote economic growth by fostering propulsive industries in favorable locations. Government tends to favor new construction such as highway and conversion of peripheral under-developed land to urban use. The effect of transport on the city growth is very tremendous.

The universal availability of adequate city activities (Oyeleye 2001) to transport plays a key role in poverty reduction and economic development of a nation as it provides access to basic movement needs of the Nation.

The transport infrastructure and urban development aids the movement of Health facilities (Mother & Child) in times of emergency, Education facilities (school buses) for timely resuming of students in schools, street lights for traffic movement in the evenings, waste management vehicles and dumping sites for environmental sanitation and health society, new round about packs for relaxation and recreational facilities with road subsistence traffic officers on tasks for road traffic management and enforcement of traffic regulations. Time spent to active these needs by urban dweller and reduce the amount of time and efforts needed to satisfy the basic movement needs of Akure people.

There are many factors influencing urban expansion and most of these are subjective. It is an accepted axiom that traffic is a function of land use. Transportation is desired for its own sake and must be considered as an instrument for achieving other desires, other expansion and building of new road in configuration. In the General Evaluation of the identical road furniture in Akure city, there are traffic lights in critical locations, controlling traffic in urban cities because it assists the road users to know when to stop and prevent the usual collision between pedestrians, cyclists and motorists but this is not enough on the study area. The shelters in the bus stops area have become an abode of the insane people, while some have been converted to open stall by traders and disallow pedestrians to utilize it as expected. Road users, mostly the drivers, motor- cycle rider are ignorant of the uses of street furniture especially drivers because they did not acquire formal driven training, where about 78% of the cyclists identified ride without driving license.

Research revealed that there is a significant relationship between contributions of street infrastructure to the safety of the road users and influence on city transport information infrastructure to the safety in Akure city. It was revealed that improvement of the city road information infrastructure will further enhance road safety and commercial activities.

Transportation rules and regulations check road users and make easy traffic and movement within the city. The study has shown that road infrastructure and urban development has contributed to road safety measures due to its instructive, advisory, educative and informative nature. It provides warning and information to all road users about their safety. Moreover, implementation of the recommendations will go a long way in solving transportation problem in Akure city.

The new Akure City map after road infrastructure and modern transport information Furniture's for safety and easy Motor Vehicles movement within the Akure Metropolis

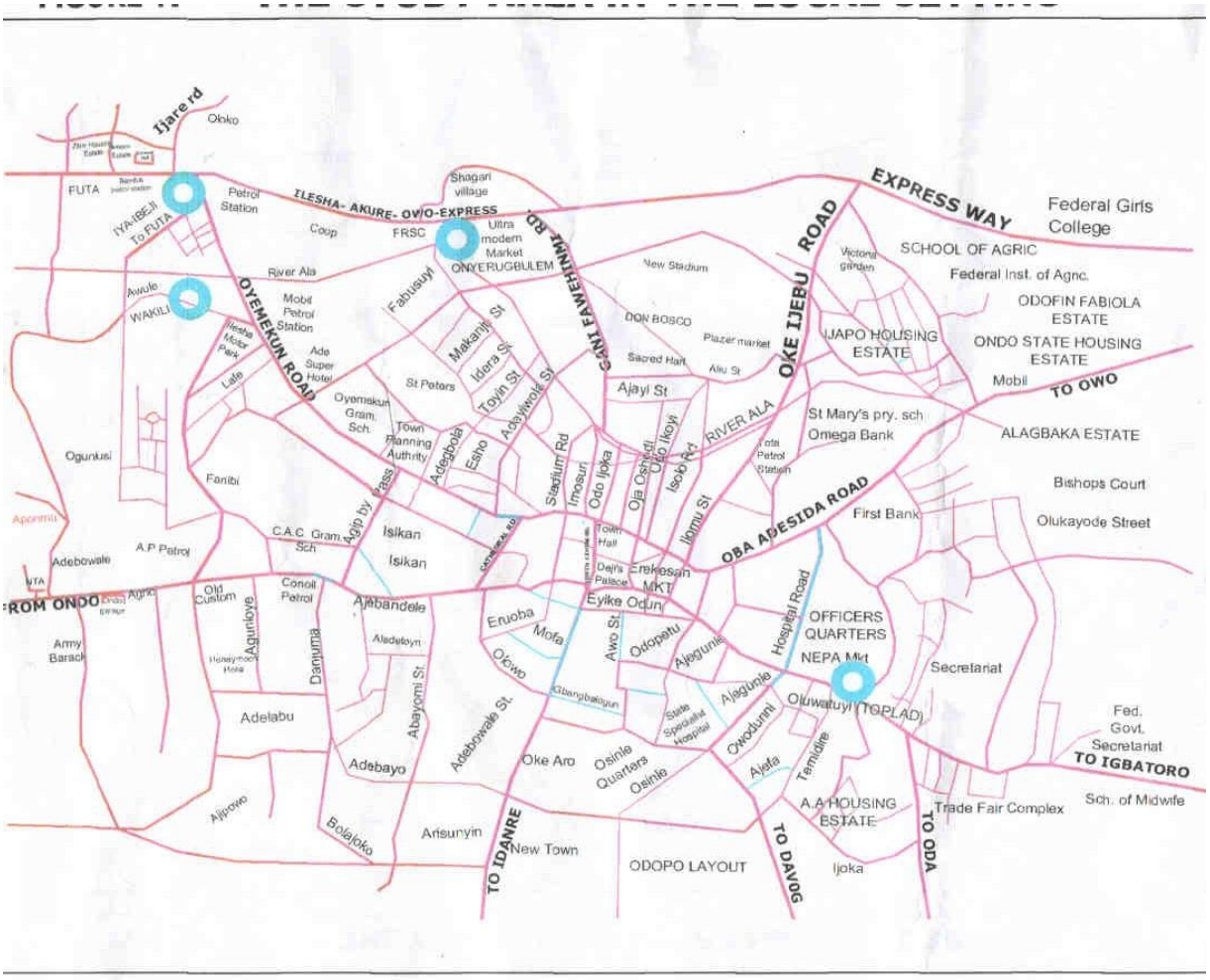


Figure 2 New Akure Town.

Recommendation

There is need to extend road building and expansion to other area of the city since movement from rural areas to Akure city is on the high rate and urban expansion also creates new resident area that need good roads and its infrastructure. Provision of functioning road traffic light at various junctions like Oda-town, Ijoka town, Adofure area, Oshile area, Wule area, and other new areas need to have functioning and operational rules and regulations on the use of Bus-stop shelters to prevent damage, misuse and the laws to be effective and functional for impediment of on-street trading and removal or obstruction this should be met by enforcing officers to mandate routine check up on the installed road infrastructure and other street furniture. There should be education and training program for all road users like drivers, cyclist, and pedestrians on road usage, infrastructure management and prevention from damage.

This research work is to contribute to knowledge and improve the awareness of the impact of road infrastructure and urban development that has economic and commercial activities with road safety and property management in urban cities. It shall be a source of information to policy makers, users of road and urban planners with transport importance impacts on urban city.

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