
Road Infrastructure and Socio-economic Transformation in Akwa Ibom State, Nigeria

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ABSTRACT

The study investigated the status of road infrastructure development and the extent to which road infrastructure share a common property with the socio-economic transformation in Akwa Ibom State, Nigeria. The total length of paved roads for more than three (3) decades (1987-2022) was sourced from the State Ministry of Works and Transport. The data were from secondary sources and key informants from the 31 sampled Nodes/Local Government Areas. Pearson Correlation Analysis was applied to examine which variables correlated or shared property. Findings revealed some milestones in road infrastructure development between 1999 and 2022 when the democratic government returned to Nigeria. This era also marked the most uncommon transformation of the socio-economic landscape of the State. The two phenomena showed a strong positive relationship and confirmed the existence of a common property identified as an "Infrastructure Development Programme". Based on these findings, the evolution of a feasible infrastructure development programme in infrastructure concession or Public-Private Partnership is a sine qua non for positive change in road network improvement and socio-economic transformation in Akwa Ibom State, Nigeria.

Keywords: *Road Infrastructure, Road Network, Socio-economic structure; transformation; Akwa Ibom State*

1. INTRODUCTION

Road infrastructure refers to the quantity and quality of roads, streets, highways, signage, bridges, drainages, parks, and bus stops provided for the flow of people,

vehicles, commodities, and services in an area (Okafor, 2020). Globally, roads are the lifeblood and backbone of the transport network. It is because road infrastructure plays a crucial role by providing mobility for efficient movements of people and goods and providing accessibility to commercial and social activities. There is a disparity in quantity, quality, and density of road infrastructure between developed and developing countries (World Bank, 2017). Premised on the fact that transportation infrastructure such as roads, bridges, airports, and ports facilitate local, regional, and international trade and long-term economic development, most countries of the developed world have made investments in transport infrastructure with higher growth returns than the developing nations (Oyedele, 2020; James and Essien, 2019). It is why governments of developing countries have prioritized the provision of critical road infrastructure in line with the United Nations Sustainable Development Goals (SDGs) of targeting industry, innovations, and infrastructure in Goal No. 9 (United Nations, 2022).

Road transportation is the most frequently used means of transporting goods and people in most African countries, making road infrastructure a key player in driving economic development and opportunities (Brickstone, 2020; World Bank, 2022). Further insight on the Brickstone (2020) report indicated that inadequate road infrastructure is responsible for retarding economic growth potentials, undermining export competitiveness of agricultural produce and other manufactured goods, and curtailing the opportunity for employment, business, development efforts in health, education, and other social services in Africa. A similar report by World Bank (2017) showed that Africa lags behind the rest of the world in all aspects of road infrastructure development in quantity, quality, cost, and access. Other reports have also indicated that the majority of roads in Africa are still unpaved and that more than 80 percent of them are only in fair while 85 percent of rural feeder roads are in poor condition and not useable during the wet season (Africa Development Bank 2020; OECD 2020; United Nations 2022).

In Nigeria, road networks are classified into three. The Federal government takes responsibility for 18% (32,000km) of the roads, The State government 16% (31,000km), and the Local government 66% (mostly earth roads/feeders roads) (Businessday NG, 2021). While the local government lacks the legislative and financial capacity to develop roads (Dimnwobi *et al.*, 2019; Businessday NG, 2021), the development of road infrastructure rests on the Federal and State governments. However, the government's commitment to addressing the road infrastructure deficit has not translated into success. Nigeria continues to face a burden of road

infrastructure deficit as the roads across the country portend dangerous death traps for the users (Aderogba and Adegboye, 2019). In Nigeria, only 60,000km out of road network of 195,000km are paved (World Data, 2020). The remaining 135,000km are either unpaved, disrepair, or poorly maintained (World Data, 2020, Dimnwobi *et al.*, 2019). The situation of poor road infrastructure has been attributed to the government's misplaced priorities and diversion of budgetary allocation meant for road infrastructure development (Businessday NG, 2021). The Federal government seeks to leverage its "Road Infrastructure Scheme" – a Public Private Partnership (PPP) intervention that enables the government to engage private sector capital and efficiency for road infrastructure development.

At the State level, most State government lacks the resources, political will, institutional framework, and commitment to pursue a definite road map for road infrastructure development (Businessday, 2021). However, in Akwa Ibom State, the story has been different. The State experienced an infrastructure renaissance since the beginning of the new political dispensation in 1999 (AKSG, 2020). The facts and realities bordering road infrastructure development in the area have been fully captured in previous studies (Okafor, 2020; Berger, 2022; and Udonguak, 2023). However, few studies investigated the relationship between road infrastructure and the socio-economic transformation of the State. The underlying question is: To what extent does the advancement in road infrastructure correlate with the emergence of socio-economic structures in the area? What common property underlies the relationship between road infrastructure development measured as the cumulative network of roads and socio-economic transformation in the area? Given the above, this study seeks to:

- i. Examine the status of road infrastructure development in Akwa Ibom State.
- ii. Highlight the emergent socio-economic structures as concomitant of road development in Akwa Ibom State.
- iii. Investigate the underlying property and relationship between road infrastructure and socio-economic transformation in Akwa Ibom State.

2. THEORETICAL FRAMEWORK

The development theory of transport infrastructure has formed the underlying theoretical foundation upon which researchers rest their argument that transport infrastructure engenders the development of a region. The main assumptions of this theory are:

- i. The forward – induced effects of road infrastructure on economic growth demonstrates how road infrastructure creates an increase in demand for factors of production, thereby increasing the investment of factor markets; stimulates investment in new businesses and firms which overall leads to economic growth (Banister,2012). The efficacy of road infrastructure is demonstrated through the emergence of new employment opportunities with improvement in citizen quality of life and socio-economic wellbeing. In other words, roads are the arteries through which the economy pulses (World Economic Forum,2015). Roads link producers to marketers, workers to jobs, and catalysts for the value chain in a productive economy.

- ii. The Ripple effect of road infrastructure on the socio-economic landscape. This assumption demonstrates direct and indirect effects of road networks as lowering transport cost, access and safety (World Economic Forum, 2015). In this fashion, road infrastructure plays a critical role by providing mobility for the efficient movement of goods and people, providing access to social and cultural activities.

Empirically, many studies both at the macro and micro scale have verified the assumptions put forward in the transport – development theory. Njoh (2019) examined this theory in Central and West African development and showed that the cumulative development indices of the region indicate improvement in road infrastructure. Quality roads network facilitates business growth, employment opportunities and economic development. Choy *et al.* (2020) investigated the impact of road infrastructure on economic growth for 60 countries from 1980-2010; findings showed that growth in road length per thousand populations, per capita export, per capita educational expenditure, and physical capital stock per worker contributed positively to economic growth. In Wales, Piedad Consult (2020) identified key areas of road infrastructure that impacted positively on the socio-economic landscape and observed a reduction in transport and production costs, impact on labour catchment, impact on the competition in local markets, impact on inward investment, organization of land use and opening of sites.

Gaurner *et al.* (2021) confirmed that places with improved accessibility from new major roads experienced increases in local firms

and the higher local employment, with a 10% increase in accessibility yield and a 3-4% increase in businesses and employment. Yusupor (2020) used a two- wave data set with regional data and household characteristics to estimate the differentials created by regional level access to national roads. The result showed a significant increase in household monthly earnings for the baseline year. The evidence provides the empirical and theoretical underpinning for the study to investigate the shared property and the relationship between road infrastructure development and socio-economic transformation in the Akwa Ibom State of Nigeria.

3. THE STUDY AREA

Akwa Ibom State is a compact and littoral State of Nigerian with over 4 million people living on a land area of less than 8000sqkm (Ufford, 2022). The State is unarguably one of the densely populated States in Nigeria (Ufford, 2022). Owing to the abundance of hydrocarbon deposits on its shores and off-shore zones, the State has access to oil derivative funds from the Nigeria Federation Account. These resources have been the anchor for massive infrastructural development in the State since 1999 when the new democratic dispensation set in. The current road infrastructure consists of 7000km of paved and unpaved roads. Out of which 3526.8km (56%) belongs to the local Government, 2195.2km (34.3%) are State – Owned while 602.0km (9.6%) are Federal roads (AKSG, 2020; Ufford, 2022). Apart from its annual budgetary allocation of an average of 15% of the budget to road infrastructure, the State operate an institutional framework for road maintenance with a budget of over 2 billion in the 2020 fiscal year alone (AKSG, 2020). At the moment, the State boast of 5 flyovers, several bridges including the 1.15km Uko-Ntighe Afi bridge linking two LGAs of Mbo and Esit Eket, underground drainage system, motor parks, traffic lights and road signs as part of its road infrastructure (Okafor, 2020; AKSG, 2022). Hence, there is a need to examine road infrastructure development and socio-economic transformation in the Akwa Ibom State.



Fig. 1: The Study Area



Fig 2: Federal and State road network in Akwa Ibom State

4. MATERIALS AND METHOD

We applied the cross –sectional research design to sample 31 Local Government Areas of the State. We considered road networks, motor parks, drainage, and bridges to measure road infrastructure. The Ministry of Works and Transport provided data for road infrastructure. The measures of socio-economic transformation were:

- i. Number of recreational centers in each L.G.A
- ii. Number of retail shops
- iii. Number of markets
- iv. Number of eateries

These were the dependent variables for the study. The data were sourced from Published materials and field observation using checklists and trained field assistants. Data were analysed using the Pearson Product Moment Correlation on Statistical Package for Social Sciences (SPSS) version 17.0.

5. RESULTS AND DISCUSSION

Road infrastructure development in the Study Area (1987-2022)

Road infrastructure in the Akwa Ibom State took a dramatic turn in 1999 when the democratic government returned to Nigeria. Before this time, it was largely pedestrian with a low network of paved roads. Table one displays the total length of paved roads in the 31 local government areas in the Akwa Ibom State for 3 baseline years – 1987 (when the State was created); 1999 (when the democratic government returned) and 2022 (when the last official update in road development was reported). We chose these 3 epochs or reference periods to track the advances made in road infrastructure to relate with the current socio-economic transformation.

Table 1: Road Network (km) of Paved Road in Akwa Ibom State by Local Government Areas

S/N	LGA	1987	1999	2022
1.	Abak	24.44	25.34	40.7
2.	Eastern Obolo	0*	0.51	25.0
3.	Eket	21.17	35.61**	137.0***
4.	Esit Eket	5.73	20.88**	30.0
5.	Essien Udim	8.97	35.61**	155.0***
6.	Etim Ekpo	0*	10.68	20.6
7.	Etinan	20.86	7.83	73.3***
8.	Ibena	0*	1.22	6.0
9.	Ibesikpo Asutan	0*	16.8	70.0***
10.	Ibiono Ibom	5.39	11.94	11.0
11.	Ika	0*	4.15	11.3
12.	Ikono	12.33	24.13	35.6
13.	Ikot Abasi	33.97	44.27	62.0
14.	Ikot Ekpene	20.57	35.13	71.0***
15.	Ini	0*	4.24	30.0
16.	Itu	10.57	10.51	23.0
17.	Mbo	0*	18.95**	25.0
18.	Mkpat Enin	10.68	44.41**	47.0
19.	Nsit Atai	0*	7.32	33.0
20.	Nsit Ibom	0*	10.38	22.7
21.	Nsit Ubium	4.28	11.24	37.0

22.	Obot Akara	0*	21.68**	27.0
23.	Okobo	12.2	11.9	29.7
24.	Onna	12.63	13.46	147.3***
25.	Oron	4.89	9.11	27.2
26.	Oruk Anam	50.87	38.3	117.0***
27.	Ukanafun	12.82	9.12	52.0***
28.	Udung Uko	0*	4.61	9.0
29.	Uruan	19	21.8	25.0
30.	Urueofong Oruko	11.29	14.83	19.0
31.	Uyo	31.29	45.19	151.6***
	Total	339.95	570.78 (230.83)	1,571 (100.22)

N/B * LGAs with zero network of paved road in 1987

** LGAs with significant improvement in road network by 1999

*** LGAs with massive network of paved road by 2022.

Source: Akwa Ibom State Ministry of Works; AKSG website

Table 1 indicated 339.95km of paved road existed in 1987 when the State was created from the Cross River State. At that time, 11 LGAs representing 25% of 31 local government areas had zero length of paved road. Local Government Areas such as Eastern Obolo, Etim Ekpo, Ini, Ibeno, Ika, Mbo, Obot Akara and Ibeno were inaccessible and largely pedestrian. However, between the period of the State creation (in 1987) and the onset of democratic governance in 1999, an additional 230.83km of paved road was developed. Despite this increment in the road network, a segment of the State was significantly unpaved. Only 6 LGAs representing 19.3%, received significant improvement in road network as of 1999. From the data, it is clear that the re-emergence of democratic government heralded the era of large scale improvement in road infrastructure in Akwa Ibom State. More than 1000km of road were developed between 1999 and 2022. Massive road development was reported in most parts of the State, particularly in Uyo, the State capital, Oruk Anam, Oron, Onna, Essien Udim, Eket, Ikot Ekpene, and Etim Ekpo. This period also witnessed significant development in bridges (Plate 1), flyovers (Plate 2), ring roads (plate 3), and underground drainage systems (plate 4) in the State.



Plate 1: Longest bridge linking Mbo and Esit Eket

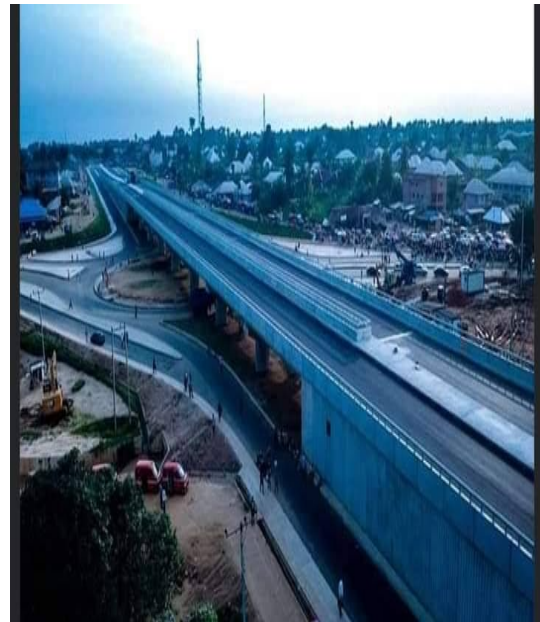


Plate 2: Flyover in Akwa Ibom State



Plate 3: Ring Road in the Study Area



Plate 4: Underground drainage

Furthermore, the road linkage and nodal development in the State also witnessed significant change during these epochs (Table 2). As of 1987, there were 28 road linkages in the entire State. Road linkages are indicators of connectivity and spatial integration in an area. The low level of road linkage clearly shows that most settlements in the State were off-road and isolated from their nearest neighbour (Idiong, 2016). Data in Table 2 show that 16 of the 31 local government areas were unconnected by road and the nodal points necessary for rural development. Theoretically, nodes are central places that exert centrifugal forces on their adjoining areas and hinterlands. Therefore, the nodes or road linkages in rural areas are linked to socio-economic development in most regions (Idiong, 2016). Plate 5 displays the round-about located at Ibesikpo Asutan. The round-about represents a road linkage/nodal point that attracted significant socio-economic development.



Plate 5; Round About at Ndung Udoe, Ibesikpo Asutan



Plate 6: Itam Central Motor Park, Itu L.G.A.

Regarding motor parks, only 10 Local Government Areas had motor parks as of 1987 (Table 2). Specifically, only 17 motor parks were in the State in 1987. This number increased to 33 in 1999 and 50 in 2022. It shows an increase in the number of motor parks vis-à-vis road linkages. It is so because nodes known in local parlance as “junctions” act as “rural central places” in Nigeria. Plate 6 displays Itam Motor Park, the largest motor park in the Akwa Ibom State.

Table 2: Nodes, Linkages and Motor Park

S/N	LGA	No. of Nodal Point/linkages			No. of motor Park		
		1987	1999	2022	1987	1999	2022
1.	Abak	4	5	6	1	1	4
2.	Eastern Obolo	0	1	1	0	1	1
3.	Eket	3	5	6	2	2	3
4.	Esit Eket	0	2	2	0	0	0
5.	Essien Udim	0	2	1	0	0	0
6.	Etim Ekpo	0	2	3	0	0	0
7.	Etinan	3	2	3	1	1	1
8.	Ibeno	0	1	4	0	1	1
9.	Ibesikpo Asutan	0	2	2	0	1	1
10.	Ibiono Ibom	0	1	2	0	1	1
11.	Ika	0	1	1	0	0	0
12.	Ikono	1	2	3	0	1	1
13.	Ikot Abasi	2	2	4	1	2	2
14.	Ikot Ekpene	3	6	4	3	3	4
15.	Ini	0	1	2	2	1	2
16.	Itu	2	2	2	2	2	2
17.	Mbo	0	2	2	0	1	1
18.	Mkpat Enin	1	3	3	0	0	1
19.	Nsit Atai	0	1	2	0	1	1
20.	Nsit Ibom	0	2	4	0	1	1
21.	Nsit Ubium	0	0	2	0	1	1
22.	Obot Akara	0	2	1	1	1	1
23.	Okobo	1	1	2	0	0	1
24.	Onna	2	2	2	0	1	1
25.	Oron	1	2	3	0	1	2
26.	Oruk Anam	0	1	2	0	1	2
27.	Ukanafun	1	1	3	0	1	1
28.	Udung Uko	0	2	2	0	0	0
29.	Uruan	0	1	1	1	2	2
30.	Urueofong Oruko	1	1	1	0	1	1
31.	Uyo	4	6	10	3	4	11
	Total	28	64(36)	84 (20)	17	33(16)	50(17)

N/B Figures in Parenthesis are the periodic increment in road linkages and motor parks
 Source: AKS Ministry of Transport



Table 3: Socio-economic Structure in the Akwa Ibom State

S/N	LGA	Market			Retail Shop			Eatery			Recreational Center		
		1987	1999	2022	1987	1999	2022	1987	1999	2022	1987	1999	2022
1.	Abak	1	6	20	18	19	30	4	6	20	0	3	10
2.	Eastern Obolo	1	1	10	1	3	22	0	2	22	0	1	3
3.	Eket	6	11	37	11	20	35	10	21	15	2	6	15
4.	Esit Eket	1	1	3	0	1	6	0	0	35	1	1	5
5.	Essien Udim	1	1	3	1	3	10	0	2	7	0	1	2
6.	Etim Ekpo	1	1	8	0	1	5	0	1	15	0	1	1
7.	Etinan	2	2	10	4	5	16	4	5	14	1	1	2
8.	Ibeno	2	2	8	1	2	10	2	3	12	1	2	5
9.	Ibesikpo Asutan	4	6	13	7	14	42	6	9	10	1	3	7
10.	Ibiono Ibom	1	1	5	5	21	50	5	7	25	0	1	4
11.	Ika	1	1	4	0	2	12	0	2	28	0	0	1
12.	Ikono	3	4	12	1	3	14	1	3	10	1	3	5
13.	Ikot Abasi	6	7	15	8	11	35	4	7	15	1	2	4
14.	Ikot Ekpene	10	15	35	8	11	52	14	15	27	2	7	15
15.	Ini	1	2	10	1	2	10	0	1	6	0	0	1
16.	Itu	1	1	5	8	11	30	3	5	13	1	3	5
17.	Mbo	1	1	6	0	1	8	0	1	10	0	0	1
18.	Mkpat Enin	3	3	12	0	2	8	0	2	10	0	0	1
19.	Nsit Atai	1	1	7	2	5	15	0	1	11	0	0	1
20.	Nsit Ibom	2	2	11	7	10	20	2	3	21	0	0	2
21.	Nsit Ubium	1	3	10	5	11	25	2	7	18	0	1	1
22.	Obot Akara	1	2	7	0	5	10	0	2	10	0	0	1
23.	Okobo	2	2	10	5	8	10	0	2	11	0	0	1
24.	Onna	2	3	10	3	3	8	1	2	12	1	3	15
25.	Oron	7	8	22	10	12	20	10	11	26	2	5	15
26.	Oruk Anam	1	2	9	5	8	12	0	0	10	0	0	3
27.	Ukanafun	2	3	15	2	2	10	0	2	9	0	2	5
28.	Udung Uko	1	2	10	0	4	8	0	0	5	0	0	1
29.	Uruan	2	3	12	3	3	10	1	1	10	1	3	5
30.	Urueofong Oruko	2	2	8	0	3	8	0	1	8	0	0	1
31.	Uyo	15	22	74	20	25	106	25	37	100	15	40	72
	Total	84	121	427	136	212	647	94	156	545	30	89	210
			(37)	(306)		(76)	(435)		(62)	(389)		(50)	(121)

N/B: Figures in Parenthesis are the periodic increment in Socio-economic Structures in the area. **Source:** Statistical year book/Field Survey

i. Road Infrastructure and Socio-economic Transformation

The main thrust of this paper is to demonstrate the link between road networks and socio-economic transformation in the study area. This section displays the frequency count of four socio-economic variables- market/ or supermarket, retail



shop, eatery, and recreational center in the Study Area. Table 3 presents data for the baseline period considered in the study.

A cursory examination of the data shows significant leaps in the emergence of the four socio-economic structures for the intervening periods of 1999 to 2022. Specifically, the volume of markets/supermarkets as of 1987 was 84. As of 1999, it was 121 showing an increment of 37, and 427 as of 2022, with an increment of 306. The change may be a result of the road infrastructure. Moreover, the number of retail shops, eateries, and recreational centers for the baseline years also portrays an incremental change. We used baseline data for 2022 to conduct a correlational analysis to test the theoretical proportion linking road transport with socio-economic development. The independent variable (total length of the road network in km) was used to correlate with the four socio-economic variables (market, retail shop, eatery, and recreational center) as development variables. The significance test was at the level of 0.05 (2-tailed). Table 4 displays the result.

Table 4: Road infrastructure and socio-economic structure correlate

	X ₁ Road Network	Y ₁ Market/ Super market	Y ₂ Retail Shop	Y ₃ Eatery	Y ₄ Recreational Center
X ₁ : Road network	1	.821*	.719*	.781*	.685*
Sig. (2-tailed)		.001	.000	.000	.006
N	31	31	31	31	31

Correlation is significant at the 0.05 level (2-tailed)

Source: SPSS Analysis

As data in Table 4 indicated, the Pearson correlation coefficient was significant in every case ($P > 0.05$). Moreover, the direction of the relationship between the road network and each socio-economic variable was positive. It showed a significant relationship between the road network and all the socio-economic variables tested. The high correlation between paired variables (socio-economic and road network) indicates a common property. The property which underlies the relationship between road network and market (.82), road network and eatery (.78), and road network and recreational center (.68) is most likely an infrastructure development programme. It is so because the infrastructure development programme provides the platform for



improvement in the road network that is a catalyst for socio-economic structures. These findings agreed with Njoh (2019); Yusupor (2020); Gaurner *et al.* (2021), who confirm theoretical propositions that transportation and road infrastructure share a common variance with socio-economic transformation.

6. CONCLUSION AND RECOMMENDATIONS

This study affirmed the theoretical assumption that institutional framework, political will, and commitment to a good democratic government drive infrastructural development in emerging societies. The massive road infrastructural development witnessed during the democratic government has attested to this. Furthermore, in confirmation of the transport development hypothesis, improvement in road infrastructure remains catalytic to socio-economic transformation anchored on a sound infrastructure development programme. Increasing nodal linkages engender spatial integration of isolated settlements and activate the growth of rural central places. It further creates a multiplier effect in the emergence of socio-economic structures upon which transformation occurs. Based on these facts, we recommended the following:

- i. Strengthening good democratic governance and sound institutional framework is a *sine qua non* for road infrastructure development in emerging societies such as Akwa Ibom State, Nigeria.
- ii. Infrastructure development programme should be evolved and driven on a Public Private Partnership model or concessional framework.
- iii. Further verification of road infrastructure and socio-economic transformation correlates at a larger scale to further strengthen the theoretical foundation.

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