



Infrastructure Finance Options for Road Maintenance in Jimeta – Yola, Nigeria

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ABSTRACT: Preliminary investigation on roads in Jimeta, Adamawa State, Nigeria reveals that there appears to be no reliable and sustainable arrangement for road infrastructure maintenance in the State and that infrastructure finance arrangement appears to be one of the key problems. This study was then set to establish the state of Jimeta roads, need for road infrastructure maintenance and the best finance option that can be utilised. Data collection was done by updating the Jimeta Street Guide Map and preparing an inventory of the observed conditions. Questionnaires were administered on 240 residents of the roads selected by simple random sampling technique while 20 infrastructure officials of the State and LGA offices ranked suggested infrastructure options. The percentage statistic was used to analyze the data obtained, while the mean was used to evaluate the finance option proposed. The findings of the study are that about 80% of the roads in the study area need maintenance, and that a hybrid of Public-Private Partnership road infrastructure finance option is best suited for their finance and was recommended.

Keywords: Road, Infrastructure, Maintenance, Finance Options

I. INTRODUCTION

Finance is one of the most crucial factors associated with infrastructure development and maintenance the world over. Fasakin (1998) acknowledged this all important factor in his consideration of the master plan making process. The Quantity Surveying profession is framed around understanding what it may cost to implement a development project; whether it is new or a maintenance job. The Town Planner, who is busy planning infrastructure facilities, is always unhappy to see that fund stands as a barrier in the implementation of his plan or in maintaining existing infrastructure. That is why infrastructure development planners refuse to stop at designing infrastructure but also explore infrastructure finance options so that their dreams can be actualized; after all, planning is dreaming dreams, both small and big; and seeing the dreams through. Literatures abound on Public Private Partnership (PPP); Build, Operate and Transfer (BOT); Infrastructure Concession; Counter-part Funding; Self-help Project Development Funding and the World Bank Infrastructure Development Fund (IDF) Assisted Projects (Woodhouse, 2005; Yanosek *et. al.*, 2007; Caspary, 2009; Ilesanmi, 2008; Orr, 2007; Torrance, 2007 a and b; Ettinger *et. al.*, 2005; and Schur *et. al.*, 2006). America enacted the National Infrastructure Bank Act of 2007 upon the realization that America's infrastructure deserved much more than its overall grade of "D".

What is the overall grade of Nigeria's infrastructure? The obvious answer is in the 'poor' range and it deserves the attention of all. While it may be argued that other socio-political factors have roles to play in infrastructure condition, appropriately sourcing and disbursing fund still remains a key issue to road maintenance. At the Federal level, this need has been recognised leading to the establishment of the Federal Road Maintenance Agency (FERMA) which has no State level equivalent at the moment. Rural roads suffer great neglect because of lack of fund to put them in place while many urban roads that were built are not being maintained as at when due thus increasing the damage. Infrastructure development and maintenance finance options have both suffered from fund quantum and misappropriation. Infrastructure finance, and more specifically, road financing, plays a major role in the current state of road development and maintenance. This position is based on the understanding that infrastructure represents the "engine" or at least the "wheel" of economic activity (Ogbuzobe, 1997). Kadiri (2002) is of the view that politicians have often believed that the aim of infrastructure is to ensure development of the areas for which they are being provided, thus emphasizing the critical roles of well developed and maintained infrastructure.

The importance of road network in physical development, according to Akinola (1998), is analogous to the role of blood vessels in human anatomical system. Thus road network is the main frame or the medium of socio-economic, political and cultural interactions within every society; and that, when roads are dysfunctional, other sectors as housing, recreation, commerce and other infrastructure facilities and services are affected.

Government policies around the globe and the world's capital markets are currently more enthusiastic about emerging markets infrastructure with renewed enthusiasm on new sources of funding for infrastructure development attracting greater interest in Private Sector and Public-Private Partnerships (PPP). From the private sector perspective, the flow of PPP deals is inconsistent and in many markets, is constrained by politics, making it difficult to build long-term business around the hope that this opportunity will materialize. At the same time, some emerging market host countries (such as China, India and Qatar) are ramping up aggressively as project sponsors. In particular, Chinese investors and the government of China are taking a growing role in infrastructure investment in Africa and other parts of the emerging world.

Growth in private infrastructure investment funds has been driven by robust capital market activity and low interest rates. However, the sheer number of new funds has led to intense competition for assets, rising prices and talk of "a bubble". At the same time new sources of funding are becoming available from public financing institutions in emerging countries, particularly the Export-Import Banks of Brazil, Russia, India and China (the BRIC countries). Traditional multilateral agencies are undergoing a period of "soul searching" as they try to re-establish their relevance and role in the midst of competition from new financial institutions in the emerging markets. In addition, the availability of local currency financing in many of the emerging market is at all time high thus increasing options for infrastructure finance.

There are new sources of infrastructure finance and sponsor (Woodhouse, 2005; Yanosek *et. al.*, 2007; Caspary, 2009). There are private infrastructure financing that are local and regional in origin (Orr, 2007; Torrance, 2007 a and b; Ettinger *et. al.*, 2005; Schur *et. al.*, 2006). This paper focuses on developing road infrastructure maintenance finance options for Jimeta-Yola Nigeria. Finance option is important because the amount of money required for road maintenance is huge. It is often said that one gets what one pay for and this is certainly true for road maintenance. The design team ensures that the finance limit is not exceeded by means of finance planning and finance control. Finance control starts at the design stage, and continues throughout the road maintenance. If a well structured finance option is available, facilities can be developed and maintained with less difficulty. The principle of intervention for road maintenance should be the golden action of the hour.

Jimeta-Yola, the administrative headquarters and centre of commercial activities in Adamawa State is experiencing road maintenance challenge. There are visible features of road shoulder breakage, wears and tears of road materials, worn out road marks, potholes and other manifestations of poor infrastructure state, which may culminate or degenerate into road decadence. The situation is already resulting into traffic delay, congestion, travel time wastage and preventable accidents. Preliminary investigation reveals that there appears to be no reliable and sustainable arrangement for road infrastructure maintenance in the State. The State Ministry of Works which is expected to continue the tasks of the historic Public Works Department (PWD) is not at all fashioned for that purpose in its daily tasks neither is there any State level version of FERMA and as such shortage of finance for the proper maintenance needed for the elongation of the road's service life is the principal issue. Ministries, agencies and parastatals that have acquired aged machineries for maintenance purpose are either grounded or requiring maintenance themselves. Since virtually all roads require some form of maintenance before they come to the end of their service life (Wikipedia, 2008), exploring appropriate infrastructure finance options to address road maintenance problem is timely in Jimeta-Yola, thus this research.

Over the past few years, lack of maintenance of the roads in Jimeta-Yola has led to a situation where every incoming government tries to make its presence felt all around the same major roads at the expense of the roads in the hinterlands and in other obscure but very useful locations. Given an appropriate, accessible and sustainable infrastructure development and maintenance option, the roads will last longer and many other areas will receive the deserved attention as well. Now that there are diverse infrastructure finance options, an empirical study of this nature is required to make appropriate recommendations to the infrastructure authorities in Jimeta-Yola on what options to adopt.

The aim of the study is to explore infrastructure finance options for road infrastructure maintenance in Jimeta – Yola, Nigeria with a view of making appropriate proposal for sourcing fund to address road infrastructure maintenance in the study area.

The objectives are:

- a. To prepare an inventory of the condition of the roads in Jimeta – Yola.
- b. To establish the need for road infrastructure maintenance in the study area.
- c. To compare alternative road infrastructure maintenance options for the study area.
- d. To advance recommendations on road infrastructure maintenance in the study area.

Jimeta-Yola is the capital of Adamawa State, North Eastern Nigeria as shown in Fig. 1 and 2. It is in the Central Senatorial District of Adamawa State and has outlets/inlets to all the neighbouring Gombe, Taraba, Borno and Yobe States of Nigeria as well as to the Cameroon Republic in Central Africa. It is the seat of the traditional Adamawa Emirate which spreads through the State to Cameroon Republic.

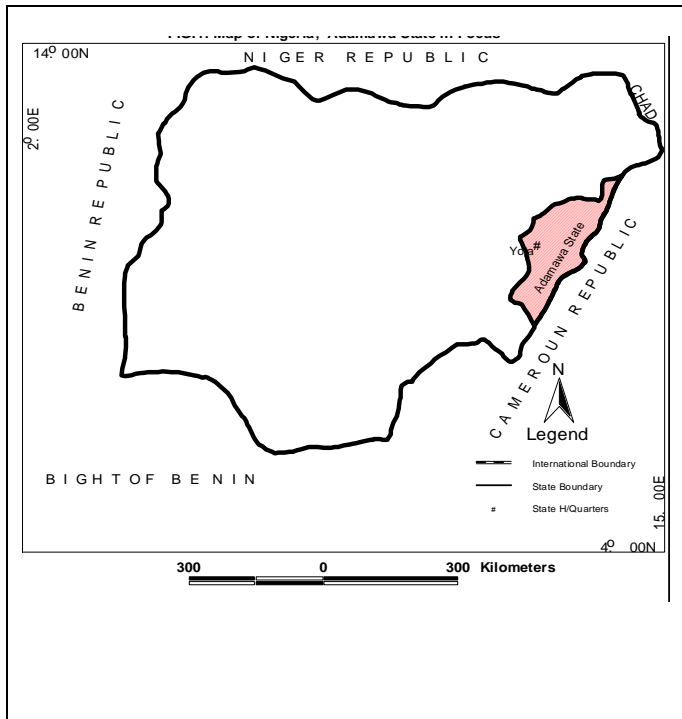


Fig. 1: Nigeria Map Showing Adamawa State.

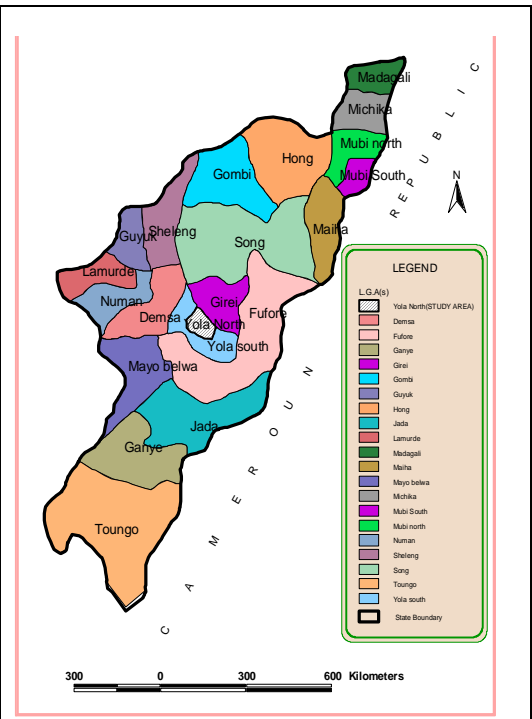


Fig. 2: Administrative Map of Adamawa State Showing the Study Area.

The circulation networks in the study area are mainly major and minor roads. The major roads are noticeably characterized by large volume of vehicles servicing the various land uses in the State capital: Schools, clinics, hotels, religious worship centres, sports fields, small and large markets, banks, residences, military formations and the Yola International Airport. The absence of a well maintained network of roads could make life unbearable in the inter- and intra- land use movements in the capital city.

II. METHODS

The Jimeta – Yola Street Guide Map sourced from the State Ministry of Lands and Survey was used as base map in identifying the roads within the study area. The map was updated using the Global Positioning System (GPS) and used in the preparation of the road condition inventory in the study area with the assistance of 300 and 400 Urban and Regional Planning students of the Federal University of Technology, Yola. The condition and other characteristics of the roads studies include name, location, length, width, surface, general state of the road, the drainage, and availability of potholes. The roads were thereafter classified into six categories thus: for every 1 bad spot on 50m road = 10, 2 bad spot on 50m road = 8, 3 bad spot on 50m road = 6 and so on.

A total of 240 residents chosen from about 9,005 residences in the study area (2.5%) were selected by stratified random sampling technique to give information of the state of the roads, the socio-economic effects of the road condition and possible maintenance funding options. The 240 respondents were selected on the basis of 20 respondents from each ward of the study area whose houses are along the roads studied. In order to generate professional views on comparing the finance options, the views of 20 infrastructure related professionals in the State Ministry of Works and the Yola South Local Government Councils were sought. All respondents in each of the above categories were also allowed to freely comment on and suggest possible road infrastructure financing options in the study area. Analysis of the state of the roads collated from the inventory of the roads was done using the mean situation taken. These were reported in maps and table forms while the responses from the questionnaire administered were tallied and presented in tables in line with the research objectives. Suggestions advanced were also presented in the study.

III. RESULT AND DISCUSSION

A. Respondents' Characteristics

The socio-economic characteristics the 240 respondents covering sex, age, marital status, educational qualification, income level, household size, occupational distribution, and number of years in service are reported in Table 1.

Based on gender classification 54.5% of the respondent were males while 45.5% were females. By age classification, 34% of the respondents were within the 21-40 years age bracket, 42% within 41-60 years and the remaining 24% in the bracket of 60 and above. This shows that more respondents were within the 41-60 years age bracket.

On marital status, 25.5% were singles, 63.8% married and the remaining 10.6% were married before but now divorced or widowed thus, more respondents were married and they out-numbered the single group and married before and now divorced or widowed group. Educationally, 21.3% were non graduates, 55.3% graduates while the remaining 23.4% did post graduate programmes, thus 78.7% of the respondents were graduates. By monthly income, 33.2% are paid N5001 – N50,000 while 39.1% are paid N50,001 – N100,000 and 27.7% were on N100,000 and above. Thus most respondents were on N50,001 – N100,000. By household size, 31.9% had household of 1-4 while 42.1% had the commonest 5 – 8 household size. The 30.2% left had 9-12 household size. Occupationally, 11.9% of the respondents were Civil Servants, 10.2% Lecturers, 6.8% Farmers, 8.5% Health Workers, 19.1% Town Planners (highest), 18.3% Civil Engineers, 17.5% Bankers and 8.5% Surveyors. On years in service, 21.3% have been on job for 1 – 5 years, 26.4% for 6 – 10 years, 40.4% for 11 – 15 years (majority), and 54.5% for a period of 16 years and above.

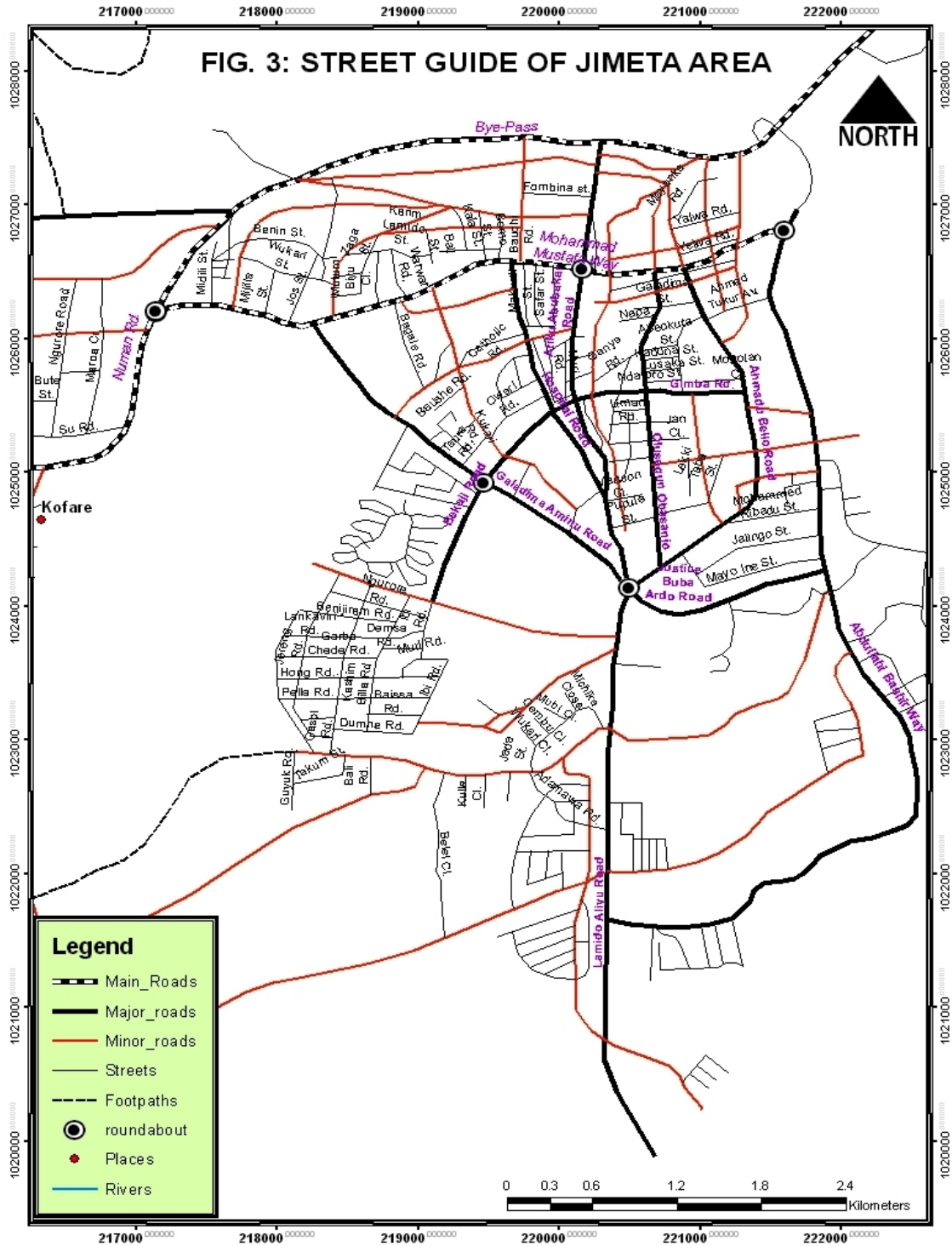
Table 1: Socio- Economic Characteristic of the Respondents.

Socio-economic characteristics	Number and percentage of features							
	Sex	Male		128 (54.5)	Female		107 (45.5%)	
Age	21 – 40	80 (34%)	41– 60	99 (42%)	60 and above	56 (24%)		
Marital status	Single	60 (25.5%)	Married	150 (63.8%)	Others	25 (10.6%)		
Educational qualification	Non graduate	50 (21.3%)	Graduate	130 (55.3%)	Post graduate	55 (23.4%)		
Income level	5001 – 10,000 78 (33.2%)		50001–100,000 92 (39.1%)		100,001 and above 65 (27.7%)			
Household size	1 – 4 75 (31.9%)		5 – 8 99 (42.1%)		9 – 12 71 (30.2%)			
Occupation distribution	Civil servant 28 (11.9%)	Lecturers 24 (10.2%)	Farmers 16 (6.8%)	Health workers 20 (8.5%)	Town planners 45 (19.1%)	Civil Engineers 43 (18.3%)	Bankers 41 (17.5%)	Surveyors 20 (8.5%)
Years in service	1 – 5, 50 (21.3%)		6 – 10, 62 (26.4%)		11 – 15, 95 (40.4%)	16 and above, 128 (54.5%)		

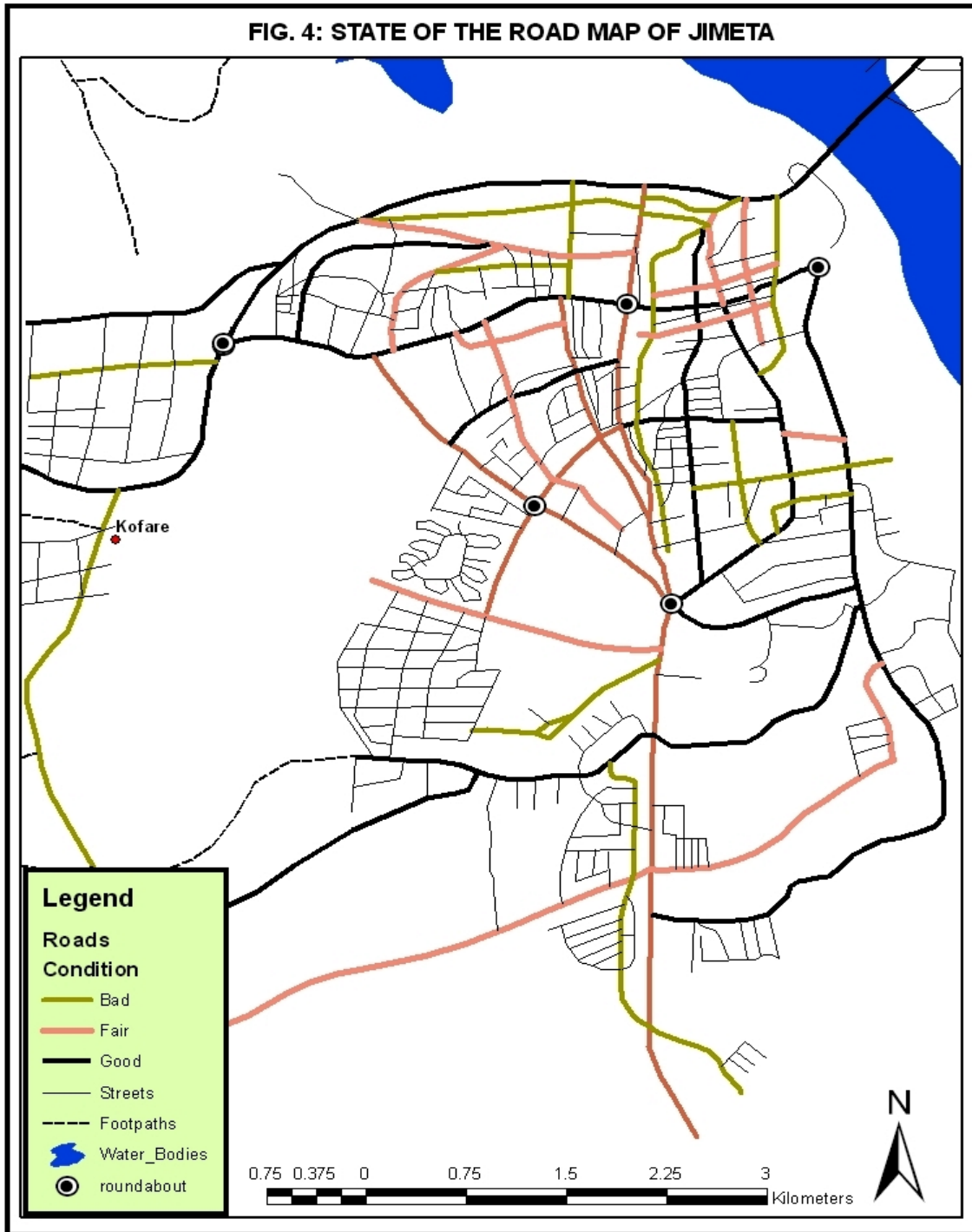
Source: Researcher’s Field Survey, 2010

B. Establishing the need for Road Maintenance in Jimeta – Yola

Fig. 3 and 4, Tables 2 and 3 and Plates 1-8 were presented to establish the need for road maintenance in Jimeta – Yola. Fig. 3 shows the Street Guide Map of Jimeta graphically identifying the streets/roads, buildings, and other unique features within and around Jimeta area. Fig. 4 shows the roads by their conditions. It shows roads with surface wears and tears, road shoulder breakages, worn out road signs, areas with no drainage and of partial drainage condition etc. Table 2 identified each of the 120 intra-city roads (totalling 119,786 m) by name, their dimensions in length and width, and observation-based remarks on each. By road length, 19.36% of the entire roads were in good condition, 6.30% had evidence of wears and tears, 40.24% of the roads were experiencing road shoulder breakage, 21.92% had blocked drainage, 7.25% were earth roads and 4.93 were out rightly poor. These show that about 80% of the Jimeta roads required maintenance as at research time. Pictures taken of the different road conditions are on Plates 1-8.



Source: Tsundass Environmental Consultants.



Source: Researcher's Field Survey, 2010.

Table 2a: Existing Situation of Roads in Jimeta.

S/N	Road/ Street	Width (metres)	Length (metres)		Remarks
1.	Numan Rd	24-30	3388	A	In good condition
2.	Mohammed Mustafa	24-30	3570	C	Evidence of wears and tears in road materials
3.	Mubi Bye Pass	24-30	7089	B	Road shoulder breakage
4.	Galadima Aminu	20-24	2986	C	Wears and tears of road materials
5.	Lamido Aliyu	20-24	4357	C	Same as above
6.	Abdulahi Bashir Way	20-24	7099	A	In good condition
7.	Justice Buba Ardo Rd	20-24	1508	A	Same as above
8.	Ahmadu Bello Rd	20-24	2918	A	Same as above
9.	Atiku Abubakar	20-24	3395	C	Wears and tears of road materials
10.	Gimba Rd	20-24	1209	A	In good condition
11.	Bekaji Rd	20-24	1875	C	Wears and tears of road materials
12.	Hospital Rd	20-24	1911	C	Same as above
13.	Olusegun Obasanjo Rd	20-24	2252	A	In good condition
14.	Gibson Jalo Rd	16-20	3917	C	Wears and tears of road materials
15.	Bishop Rd	16-20	1468	D	Unightly drainage situation
16.	Jambutu Str	16-20	2145	E	An earth road
17.	Ibadan Rd	16-20	932	C	Wears and tears of road materials
18.	Taraba Rd	16-20	907	C	Wears and tears of road materials
19.	Ajiya Str	16-20	631	E	An earth road
20.	Sarkin Wuta Str	16-20	762	D	Blocked drains
21.	Zaranda	16-20	1338	A	In good condition
22.	Bauchi Str	16-20	993	E	An earth road
23.	Garba Tarfa Rd	16-20	889	D	Blocked drains
24.	Church Str	16-20	929	C	Worn out road materials
25.	Bole Str	16-20	2078	C	Wears and tears of road materials
26.	Demsawo Str	16-20	1980	D	Blocked drains
27.	Ibrahim Attah Rd	16-20	742	D	Blocked drains
28.	Lekki Taba Str	16-20	1017	E	An earth road
29.	Mutum Biyu Rd	16-20	2050	C	Wears and tears of road materials
30.	Zango Rd	16-20	1163	C	Wears and tears of road materials
31.	Majalisa Rd	16-20	1032	C	Wears and tears of road materials
32.	Mayo Belwa Rd	16-20	1511	F	In poor condition
33.	Adamawa Rd	16-20	456	A	In good condition
34.	Abdul Kure Rd	16-20	755	A	In good condition
35.	M. Tukur Rd	16-20	799	D	No sides drainage
36.	Mokolo Rd	16-20	1058	C	Wears and tears of road materials
37.	Karewa Rd	16-20	1634	F	In poor condition
38.	Jimeta Rd	16-20	963	C	Wears and tears of road materials
39.	Fombina	8-12	503	C	Same as above
40.	Yelwa Rd	8-12	510	A	In good condition
41.	Banshika Rd	8-12	477	A	In good condition
42.	Borno Str	8-12	386	D	Blocked drains
43.	Kaala Str	8-12	341	C	Wears and tears of road materials
44.	Bali Str	8-12	259	D	Blocked drains
45.	Karim Lamido St	8-12	625	D	Blocked drains
46.	Mutum Biyu Cl	8-12	414	D	Blocked drains
47.	Warwar Rd	8-12	395	D	Blocked drains
48.	Bagale Rd	8-12	683	D	Blocked drains
49.	Sofar Str	8-12	463	D	No drainage
50.	Makurdi Str	8-12	498	D	Blocked drains
51.	Galadima Str	8-12	452	D	No drainage
52.	Abeokuta Str	8-12	260	D	Blocked drains

53.	Kaduna Str	8-12	260	D	Blocked drains
54.	Lusaka Str	8-12	261	E	An earth road
55.	Ndafaro	8-12	262	C	Wears and tears of road materials
56.	Mogolan Cl	8-12	336	D	Blocked drains
57.	Muri Rd	8-12	389	E	An earth road
58.	Ganye Rd	8-12	421	C	Wears and tears of road materials
59.	Catholic Rd	8-12	617	C	Wears and tears of road materials
60.	Owerri Rd	8-12	529	C	Same as above
61.	Zaga Str	8-12	460	D	Blocked drains
62.	Kiryra Rd	8-12	172	D	No sides drainage
63.	Taura Rd	8-12	304	D	Blocked drains
64.	Mohammed Ribadu Str	8-12	693	C	Wears and tears of road materials
65.	Mayo Line Str	8-12	1165	F	In poor condition
66.	Jalingo Str	8-12	952	D	Blocked drains
67.	Baissa Str	8-12	387	E	An earth road
68.	Lau Cl	8-12	220	B	Road shoulder breakage
69.	Jen Cl	8-12	285	E	An earth road
70.	Manson Cl	8-12	274	D	Blocked drains
71.	Pupule Str	8-12	336	D	No sides drainage
72.	Liman Rd	8-12	267	D	Blocked drains
73.	Lekki Taba Str	8-12	338	E	An earth road
74.	Kukari Rd	8-12	551	D	No sides drainage
75.	Baushe Rd	8-12	280	E	An earth road
76.	Wukari Rd	8-12	706	C	Wears and tears of road materials
77.	Jos Str	8-12	564	C	Same as above
78.	Mijilla	8-12	343	E	An earth road
79.	Benin Str	8-12	1049	D	Blocked drains
80.	Midilli Str	8-12	483	D	No sides drainage
81.	Ngurore Rd	8-12	719	C	Wears and tears of road materials
82.	Benijiram Rd	8-12	413	C	Wears and tears of road materials
83.	Lankaviri Rd	8-12	750	D	No sides drainage
84.	Garba Chede Rd	8-12	718	D	Blocked drains
85.	Hong Rd	8-12	1158	C	Wears and tears of road materials
86.	Pella	8-12	1079	D	Blocked drains
87.	Garkida Rd	8-12	238	B	Road shoulder breakage
88.	Jereng Rd	8-12	1468	C	Wears and tears of road materials
89.	Dumne Rd	8-12	568	F	In poor condition
90.	Baissa Rd	8-12	389	D	Blocked drains
91.	Ibi Rd	8-12	612	E	An earth road
92.	Muri Rd	8-12	411	E	An earth road
93.	Kashim Billa Rd	8-12	1077	C	Wears and tears of road materials
94.	Gasol Rd	8-12	1311	C	Wears and tears of road materials
95.	Jada Str	8-12	881	D	Blocked drains
96.	Wukari Cl	8-12	177	E	An earth road
97.	Gembu Cl	8-12	167	E	An earth road
98.	Mubi Cl	8-12	187	F	Unightly road condition
99.	Michika Cl	8-12	173	D	Blocked drains
100.	Takum Str	8-12	508	D	Blocked drains
101.	Guyuk	8-12	474	C	Wears and tears of road materials
102.	Bali Rd	8-12	285	D	Blocked drains
103.	Belel Cl	8-12	1259	D	Blocked drains
104.	Namibia	8-12	234	D	Blocked drains
105.	Kulle Cl	8-12	252	E	An earth road
106.	Udi Hill Cl	8-12	223	D	Blocked drains
107.	Adamawa Rd	8-12	766	A	In good condition
108.	Nepa	8-12	266	C	Wears and tears of road materials
109.	Ahmed Tukur Av	8-12	492	D	Blocked drains

110.	Demsa Rd	8-12	290	D	Blocked drains
111.	Gurin Rd	8-12	264	D	Blocked drains
112.	Benijiram	8-12	283	C	Wears and tears of road materials
113.	Yelwa	8-12	438	D	No sides drainage
114.	Mayanka	8-12	508	A	In good condition
115.	Ngurore	8-12	1199	C	Wears and tears of road materials
116.	Manoa Cr	8-12	1180	D	Blocked drains
117.	Bute Str	8-12	768	C	Wears and tears of road materials
118.	Bombado	8-12	580	D	Blocked drains
119.	Jamel Rd	8-12	842	F	No sides drainage
120.	Su Rd	8-12	1303	C	Wears and tears of road materials
	TOTAL		119786		

Source: Researcher's Field Survey, 2010.

Table 2b: Summary of the Road Condition.

Road Condition	Road Length (meters)	Percentage (%)
A = Road in Good Condition	23184	19.36
B = Road shoulder breakage	7547	6.30
C = Wears and tears of road materials	48198	40.24
D = Blocked Drainage/No Sides Drainage	26262	21.92
E = Earth road	8688	7.25
F = Poor	5907	4.93
TOTAL	119786	100



Plate 1: Aliya Street earth road with inadequate sides-drain on a minor road.



Plate 2: Bauchi Street earth road without side drainage in a minor road.



Plate 3: Wears and tears of road materials and no side drainage, on Taraba Road minor road.



Plate 4: Wears and tears of road materials and no side drainage on Bole Street minor road.



Plate 5: Wears and tears of road materials with an unsightly side drainage on Benjiram minor road.



Plate 6: No sides drainage and worn out road materials in Midili Street minor road



Plate 7: Blocked drains, and wears and tears of road materials on Taura minor road.



Plate 8: Road shoulder breakage and illegal waste collection point along Mubi Bye-Pass major road.

C. Infrastructure Finance Options most suited for Road Maintenance in Jimeta-Yola

Possible infrastructure finance options for road maintenance were derived from literature (Ning, 2007). The options were identified along three classes: Public, Private and a Hybrid of both. The ranking of these options by 20 infrastructure related staff of Yola North/South Local Governments and State Ministry of Works and Housing is as presented in Table 3. The 5-point Likert scale based on Very Inadequate (VI), Inadequate (IN), Partially Adequate (PA), Adequate (AD) and Very Adequate (VA) were used. The ranking, mean values and inferences of the responses on accessibility, sustainability and conditionality have been presented in Table 3. The overall inference is that the hybrid is most favoured by the respondents giving credence to concession and other public-private sectors partnership arrangements. Among the outstanding suggestions advanced for sourcing funds for road maintenance are using the Pension Fund instead of being siphoned into private pockets and toll gate collections. The re-establishment of the Public Works Department (PWD) in the State Ministry of Works for this purpose is to serve as the State version of the Federal Roads Maintenance Agency (FERMA).

Table 3: Mean Rating of Infrastructure Maintenance Finance Options for Roads in Jimeta - Yola.

Road Infrastructure Maintenance Options/ and Assessment Criteria	Ratings					Mean	Inference
	1 (VI)	2 (IN)	3 (PA)	4 (AD)	5 (VA)		
<i>Accessibility of finance options</i>							
Public			12	8		3.4	PA
Private				10	10	4.5	AD/VA
Public-Private				8	12	4.6	VA
<i>Sustainability of finance options</i>							
Public			7	8	5	3.9	AD
Private			8	12		3.6	AD
Public-Private				10	10	4.5	AD/VA
<i>Conditionality of finance options</i>							
Public				12	8	4.4	AD
Private			12	8		3.4	PA
Public-Private				12	8	4.4	AD

Source: Fieldwork, 2010.

D. Summary of Findings

The major findings of this research are as follows:

- a. Jimeta has about 11.979 km length of intra-city roads of different sizes out of which only about 20% are reported to be in good condition especially those leading to the Government House. Most roads in Jimeta – Yola therefore need maintenance.
- b. The most widely reported maintenance problems on Jimeta roads is the wearing and tearing away of road surface materials, followed by the blockage or absence of roadside drainages. The drainage problems have been aggravated by the untamed free-flowing pure water packaging material in Jimeta.
- c. The hybrid of Public-Private partnership in road infrastructure maintenance is most preferred by the infrastructure-related professionals in the State and Local Government offices in Jimeta – Yola.
- d. The re-establishment of the Public Works Department (PWD) in the State Ministry of Works has been suggested as a means of quickly addressing road maintenance in the State, Jimeta inclusive. This is to serve as the State version of the Federal Roads Maintenance Agency (FERMA). The Pensions Fund is a possible source of finance for road maintenance in the study area.

E. Discussion of Findings

Having established that about 80% of the roads in Jimeta needs maintenance, especially in the road shoulder breakages, wears and tears of road materials, and worn out road marks, a holistic approach to the maintenance work is required in the first instance because all elements of the road infrastructure need attention. Drains need be re-established, repaired and opened up. Pot holes need be properly filled up and road signs/marks re-introduced. FERMA is handling this type of job at the Federal Level hence the call to establish the State version of FERMA as the age-long Public Works Department (PWD) in the State Ministry of Works. There is no visible regular established maintenance crew responsible for the daily or weekly maintenance of the roads in the area. In many developed countries, there is established maintenance crew responsible for the sweeping, watering, and general preservation exercise on the road fabrics which tend to make the life span of the roads longer. Virtually all roads require some form of maintenance before they come to the end of their service life (Wikipedia, 2008). Therefore, there should be established daily to weekly regular maintenance crew.

The government was observed to be the existing sole financier of roads in the area. This agrees with World Bank (1994) that infrastructure facilities are usually provided by the public sector but are however jointly consumed by the private and public sectors. The unwillingness of government to continue to spend of such joint facilities may have led to the relegation of road infrastructure maintenance. The private sector is also unwilling to develop and maintain such facilities for the same reason and because they can be costly to undertake. Private sector has an inherent tendency to concentrate on commercial profitable investments, while a strategy of economic growth is likely to identify a different set of investment priorities. Public sector investment can be used to follow this growth strategy of investment even in disregard to commercial considerations. Private enterprise tends to avoid investing in a large variety of infrastructural facilities because of their huge investment cost, long gestation period and non-viability. If allowed to charge a “Cost Recovery Tariff”, some infrastructural facilities may remain under-utilized; providing them through public sector may be the best option because of “public interest.” The Hybrid of Private – Public Partnership in road maintenance is therefore a balanced option (Levy, 1991; Ning, 2007)). A labour intensive implementation approach of this arrangement will benefit the poor residents as SIDA (1996) opines. It is generally agreed that, non-poor households rather than poor households seem to benefit more from public infrastructure investments (Howe and Richards 1984; World Bank, 1994; and UNCHS, 1996). This situation should be reversed in the carrying out of road maintenance in Jimeta-Yola.

There is presently no institution given concession on the roads in Jimeta-Yola. The issue of concession requires caution. A concession, broadly defined, is a legal arrangement in which a firm obtains from the government the right to provide a particular service. Concessions, though an aged practice (Bezancon, 1995), can be used to create competition for the market under conditions in which the service provider has significant market power. Concession arrangements involves the shifting of risks and responsibilities from the public to the private sector and entails a myriad of legal and economic issues, including the organization of government entities responsible for concession programs and the adequacy of the broader legal and regulatory environment. The design and implementation of concession contracts that allocate risks and responsibilities and the mechanisms for evaluating and awarding projects are also of paramount importance. The government's role as regulator and as a provider of support for infrastructure concessions must also be assessed. The main rationale for concessions is that they can facilitate the regulation of natural monopolies. In markets that are naturally competitive, direct competition between firms can usually work well without recourse to concessions. Before awarding concessions, governments should therefore first determine whether competition can be made to work in the relevant activities, possibly through reforming the market structure.

Having considered the three infrastructure finance options suggested in this study (Tables 3 and 4), the Public-Private Partnership option has been proposed for major roads infrastructure maintenance in the study area. This is because it averagely ranked highest based on appropriateness, sustainability and conditionalities of

finance. Also, the task of the government which is presently the sole financier of road maintenance is getting increasingly large with the amount budgeted being released in “trickles” and as such the World Bank (1994) suggests that governments should rather focus on those areas where investments are of infrastructure nature which is necessary for facilitating growth and development as a whole and where private sector participation is not likely to come forth to an adequate extent within a reasonable time perspective. The public sector may also withdraw from areas where no public purpose is served by its presence.

The chosen option would not discard the existing finance option, but, seeks to reinforce it for better achievement. The option combines the advantage of public and private finance options. According to Ning (2007), such a partnership is typified by the sharing of responsibilities, risk, investments and rewards between partners. It draws on the strengths of both public and private sectors to establish complementary relationships. For the minor roads, it is suggested that the public financing option should still be utilized. The evolving indigenous finance options should be encouraged and adapted to aid the public finance option.

Table 4: Evaluating the Rank of Infrastructure Maintenance Finance Options for Road Financing.

Infrastructure Finance Option	Yardsticks Mean Values			Overall Mean
	Accessibility	Sustainability	Conditionality	
Public	4.4	3.9	3.4	3.9
Private	3.6	3.4	4.5	3.8
Public-Private	4.5	4.4	4.5	4.5

Source: Fieldwork, 2010.

IV. CONCLUSION AND RECOMMENDATIONS

Exploring infrastructure finance for road maintenance is necessary because when the project is implemented, the market activities and the general rate of traffic flow around Jimeta-Yola will become improved to the benefit of diverse institutions and establishments. The study has established that the roads in Jimeta – Yola are generally in a state of disrepair and need maintenance. It is hoped that the proposed partnership, the re-establishment of the PWD in the State Ministry of Works as a State version of FERMA and the adaptation of the labour intensive maintenance option rather than the capital intensive will assist in improving the road infrastructure condition in Jimeta – Yola.

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