1.0 INTRODUCTION

1.1   Osun State was created out of the old Oyo State in August, 1991. The essence of creating the State was to bring governance much closer to the people by making the administrative and public - resources management structure become much more effective and efficient. The State needed a lot of new infrastructures to do this, which placed on her some additional financial burden. The State never had sufficient financial strength to effectively shoulder such a responsibility. The Internally Generated Revenue (IGR) base is very low because Osun State is populated predominantly by people with low taxable income: peasant farmers, few public officers, and very small businesses. The level of Internally Generated Revenue base has a direct relationship with the value of the disposable income of the prospective payers. Currently, Osun State economy is substantially a subsistence economy; though prop-up by the public officers' salary. In essence, it is predominantly subsistence farming, buying/selling and public service dependent. For her financial needs, she has to therefore depend more on the funds from the Federation Account. All considered the current Administration has to address four intertwined problems as follows:

(i)   ensure full employment of all the factors of production and raise the standard of living of the populace generally;

(ii)   find a reliable and sustainable source of revenue to finance its programmes / projects;

(iii) induce / attract appropriate investments to the State; and

(iv)   Citizen- centric governance.

1.2.   The above are necessary to turn things around with a view to laying appropriate foundation for a viable State, and to move imperatively in the direction of

information society running a knowledge based economy. It is therefore necessary to diversify the sources of the revenue of the State by expanding its Internally Generated Revenue (IGR) base and reduce its dependence on the Federation Account. Consequently, it becomes absolutely necessary to modernize the economy of the State by leveraging the opportunities offered by Information and Communication Technology (ICT) to efficiently replace the less – productive, less – efficient traditional economy with knowledge economy. There is the urgent need to replace the traditional, orthodox and conventional machinery / framework with knowledge based ones. Osun State is very compact, so the cost required to fully leverage the opportunities offered by ICT should be affordable.

1.3.   Prior to the creation of the State, ICT had been recognized by Government as a key administrative tool.   The old Oyo State Government therefore created a Department of Computer Services in its Ministry of Finance and Economic Development. The core officers of the Department were indigenes of Osun State. Consequently, when Osun State was created out of the old Oyo State, a Department of Computer Services was also created in the Ministry of Finance and Economic Development of the State to fully leverage the opportunities offered by advances in ICT considering the fact that it had started playing a critical role in underpinning Government operations the world all over. Government, then, also immediately the State was created established a Computer Services Centre in the Governor's Office, a Bureau of a sort with a Director-General as the head.   The Bureau was later wound up within a short time of about three years and its staff transferred to the Department of Computer Services in the Ministry of Finance and Economic Development.

1.4.   However, from 1991–2003, nothing serious and concrete could really be said to have happened regarding ICT in the Public service of the State. All attempts towards the computerization of the activities of the past Governments with a view to introducing computerization to governance were not very successful. The fact is very clear that Government ICT no longer plays just merely a supporting role in the work environment. In a connected Government environment, ICT, has become the actual basis for the delivery of Governmental services, processes, information and transactions.

1.5.   With the compelling needs to change the public service delivery system, the new Government led by Prince Olagunsoye Oyinlola which came on board on 29th May 2003 committed itself to necessary administrative reforms and e-governance. Osun State Government from that time started to yearn for a highly effective and efficient single-window public - service delivery enterprises such that will make all public service transactions and delivery system much more effective, efficient, convenient and transparent to promote the highest level of probity and accountability. It is the desire of Government to put in place a system that will optimize the citizen-to-government (C2G) exchange of information, to promote the relationship between Government and Business Community (G2B) and to promote the evolvement of an integrated and interactive transitional/information web portal that will enhance the ability of various State and Local Government Agencies to collect, collate, process and disseminate on-line on real time basis, the administrative, judicial, legislative, financial, accounting, statistical, economic and management information to support all the salient activities of Agencies of Government, and government decision-making processes across the Local Governments and the State Government Agencies. The Governor personally committed himself to the task of creating a conducive environment for the realization

of these goals to bring about a public service system that will be a model not only in Nigeria but also in Africa.

2.0. THE EVOLUTION AND DEVELOPMENT OF ICT IN OSUN STATE

2.1. Osun State Government, on 1st January, 2005 created the Bureau of Computer Services and Information Technology (BCSIT) as the primary agency charged with the responsibility for coordinating and managing all the State Public Service Computer Resources and Information Technology related matters. The objectives of the Bureau which include, but not limited to the followings are to:

(i) initiate policies on the acquisition/uses of computer/Information Technology with a view to ensuring the efficient and effective computerization of the salient activities of the entire Public Service;

(ii) act as the Chief Adviser to Government on Computerization, Information Technology, e - governance and all related matters;

(iii) develop ICT implementation strategy to meet the global challenges so as to avert the state becoming a victim of the global – divide;

(iv) establish and manage ICT infrastructure for the entire State Public Service and ensure its optimal utilization state wide;

(v) develop ICT human capital with intention of creating and supporting knowledge-based society and to be responsible for ICT training of Public Officers and its contents' determination; and

(vi) be responsible for the acquisition, standardization, coordination, regulation of the usage and harnessing of Computer Resources, Information Technology and related matter in the Public Service; and

(vii) to liaise on behalf of the State Government with external bodies on matter concerning ICT and related matters.

2.2.   Towards achieving the very fundamental objectives behind the establishment of the Bureau of Computer Services and Information Technology in the State, a cycle of activities aimed at arriving at the desired destination, segmented into stages, were embarked upon. The different stages and phases for the evolution and development of ICT in the State as programmed by this Administration from May 29th 2003 are as follows:

STAGE ONE : This is the Emerging Presence stage and it represents the limited and most basic usage of ICT in carrying out Government business. We were at the bottom level of this stage when the present Administration came on board. The stage consists of the following different phases;

Phase I: Full computerization of the Budget preparation, implementation, monitoring, control, evaluation, review and report generation of the Ministry of Finance and Economic Development including interactive web-based applications.

Phase II: Integrated Personnel Information and Gratuity / Pensions processing scheme, salary information monitoring / processing scheme of the Bureau of Establishments and Training.

Phase III: Computerization of the activities of the Office of the Accountant –General and the Auditor- General across all Agencies of Government.

Phase IV: Computerization of Tele-health diagnostic centres and Hospital Records Management System

Phase V: Computerization of the Judicial Management System and digitalization of the Osun State Laws and Legal System.

Phase VI: Computerization of Education and School System

Phase VII: Digitalization of the Legislative Process and Interactive System.

STAGE TWO: This is the Enhanced presence stage: It is the improved version of the stage one. Though more sophisticated, the interaction is still primarily un-directional with activities and information flowing essentially from government to the citizen. This stage had been surmounted.

STAGE THREE: This is the Interactive presence stage in which the online services of the government enter the interactive services mode to enhance convenience of the consumer such as downloadable forms for tax payment, application for license renewal. Audio and video capability is provided for relevant public information. The government officials can be contacted via email, fax, telephone and post. The site is updated with greater regularity to keep the information current and up to date. This is our present stage.

STAGE FOUR: This is the Transactional presence stage. It facilitates a two-way interaction between the citizen and the government. It includes options for paying taxes; applying for ID cards, birth certificates/passports, license renewals and other similar C2G interactions by allowing the citizen to submit them online 24/7. The citizens are able to pay for relevant public services, such as fines, fees, taxes, and levies. Providers of goods and services are able to bid online for public contracts via secure links. This is the production stage we are moving into.

STAGE FIVE: *This is* Networked presence stage. It is the concluding part of other stages of e-governance. This represents the most sophisticated level in the online e-government initiatives. It can be characterized by an integration of G2G, G2C and C2G (and reverse) interactions. The government encourages participatory deliberative decision-making and is willing and able to involve the society in a two way open dialogue. Through interactive features such as the web comment form, and innovative online consultation mechanisms, the government actively solicits citizens' views on public policy, law making, and democratic participatory decision making. Implicit in this stage of the model is the integration of the public sector agencies with full cooperation and understanding of the concept of collective decision-making, participatory democracy and citizen empowerment as a democratic right.

3.0 THE MANDATE OF BUREAU OF COMPUTER SERVICES AND INFORMATION TEHCNOLOGY

3.1 The Bureau of Computer Services and Information Technology (BCSIT) is under the direct watch of the Governor through the Head of Service (HOS) in recognition of the fact that ICT would eventually alter all the legacy, orthodox and conventional mode of administration across the entire State Public Service.

3.2.   Although the Bureau of Computer Services and Information Technology (BCSIT) achievements were considered good enough via-a-vis the resources at its disposal, there are still a lot of gaps requiring necessary attention. The ultimate goal is the delivery of a "one – stop – shop" for all public services including the efficient collection of all taxes and levies accruable to the State and Local Governments. This calls for fiscal reforms aimed at establishing a simple and accessible service to the citizens. The programme is seen as a major stepping stone towards achieving other more advanced "e-administrative services".   But the skills, expertise and funds required are far more than what the State Government can bear all alone. The only choice is to partner with interested and experienced business concerns that can assist in the realization of the set objectives; through a Public Private Partnership Arrangement (PPPA).

3.4   Such participation aims at improving the quality of services provided to the citizens, alleviating the burden on the State budget without affecting the State ability to provide the necessary services at fair social prices, create job opportunities, stimulate investment and consumption; thus boosting the State economy. Through a PPPA, the Government can retain close control over the delivery of the specified level and standard of services. Where core social services are involved, these will be retained by the public sector professionals. The Government is expecting a higher quality of service delivery from PPPA. For the reasons above and because PPPA opens up new channels of finance, the Government will have more latitude in bringing forward its investment programme reform. Hence, the need to call on National/International qualified interested business organizations to partner with the State Government under a PPPA to enable the State Government attain the desired goal regarding the computerization of its Public Service and the introduction of e-governance in the State Public Service.

4.0 ACHIEVEMENTS OF BUREAU OF COMPUTER SERVICES AND INFORMATION TEHCNOLOGY

4.1.   The Bureau of Computer Services and Information Technology (BCSIT) swung into action immediately it was created in 2005. From 2005 to-date, so many things have been achieved with the short time of establishment. It is gratifying to note that the first phase of the global computerization project of the State Government is completed.   This has culminated in the following achievements among others:

(a)   acquisition of Computer Hardware and Software for the use of the State and local governments employees;

(b)   Network comprising VSAT for Internet Access Backbone fibre/CAT cables, Wireless radio/antenna, etc. connecting the Agencies of the State Government and the Local Governments Headquarters;

(c)   Structure trainings of the Public Officers from the Executive Council members to the intermediate staff level, the training still continues;

(d)   engagement of highly skilled IT – personnel on contract basis to support it on all aspects of its assignment; and

(e)   acquisition of independent power supply from both Solar and Wind to provide about forty percent of its energy needs.

(f)   Establishment of State Official Website, www.osunstate.gov.ng which facilitated direct exchange of information about Government with all stake holders both at home and in the diaspora and live streaming of Radio and Television broadcast.

(g)   Computerization of Salary Monitoring processes and Integrated Personnel Information System for the entire Public Service of Osun State, consisting of the Core Civil Service, Schools, Corporations, Parastatals and Tertiary Institutions which involved the generation of Bio-data Statistics about the individual staff classified by age,

length of service, educational and technical qualifications as well as discipline, Local government of origin, nationality, marital status, family size, salary grade level, distribution across Agencies, Sex, subject taught by teachers in schools, etc.

(h) Production and issuance of Computerized Personalized Identity Cards to all authenticated staff.

(i) Computerization of the budgetary process encapsulated in Budget formulation, Budget implementation, Budget monitoring and control, Budget review and evaluation which also involves the Publishing of the Annual Budget of the State Government.

4.2 In line with the Osun State Government policy guideline on the Information and Communication Technology (ICT) implementations, some relevant strategies for an efficient State Public Service delivery system have been put in place. This includes, among others, the following:

i. The state is currently partnering with some key players in the ICT industry in the country such as Microsoft, CISCO, HP, Oracle, National e-Governance Strategies (NeGSt) etc. for the effective development and deployment of ICT in the state.

ii. Through the BCSIT and in collaboration with every other relevant ministry, department and agency of government, the State Government is now trying hard to established an online Electronic Portal through which all citizens and residents of Osun state and those in Diaspora will have access to government information and services as and when required, without time and geographical location being a barrier.
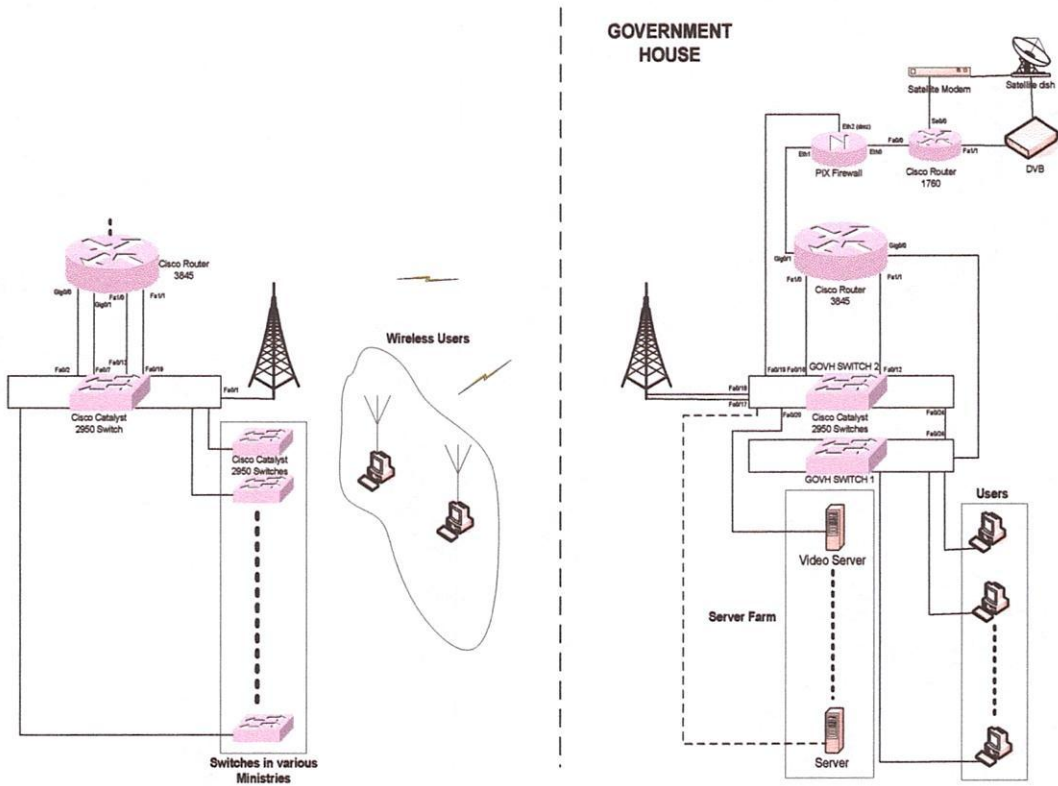
5.0 THE EXISTING OSUN STATE INFORMATION AND COMMUNICATION TECHNOLOGY'S INFRASTRUCTURE

5.1 The following are the architectural summaries of the existing information and communication technology's infrastructure of the Osun State Government.

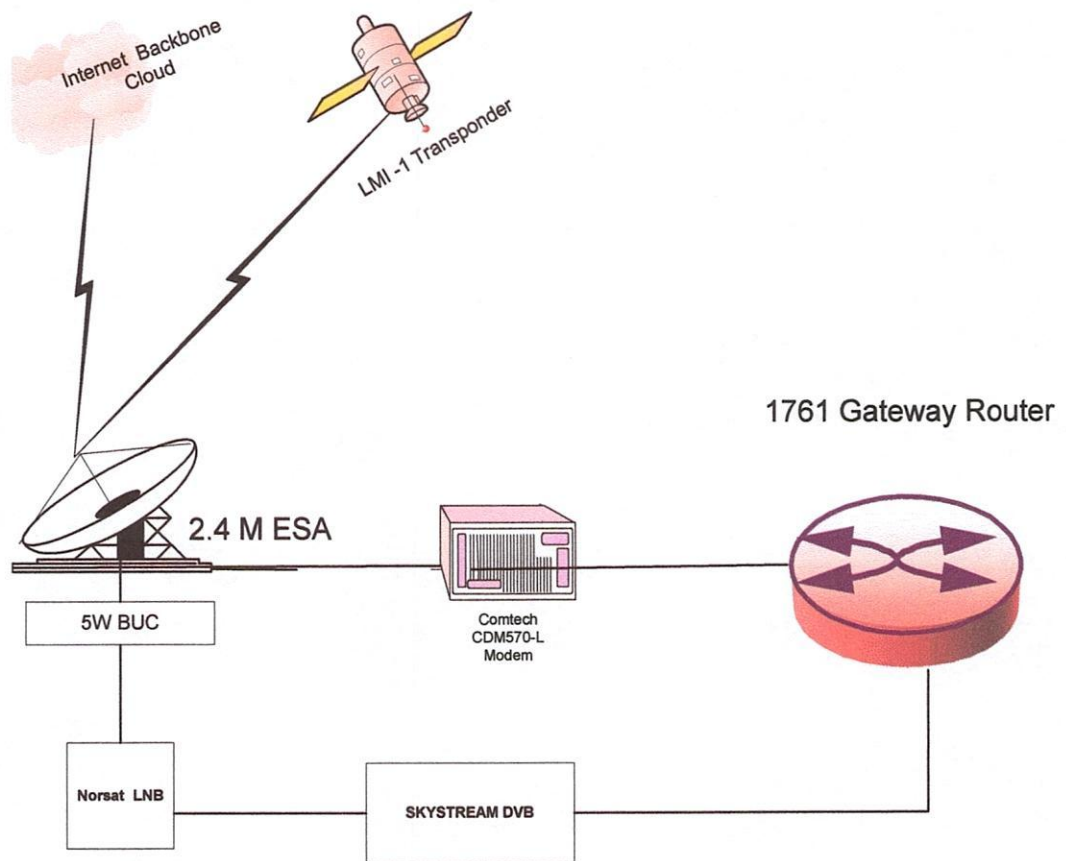**NETWORK DIAGRAM OF OSUN STATE GOVERNMENT NETWORK**
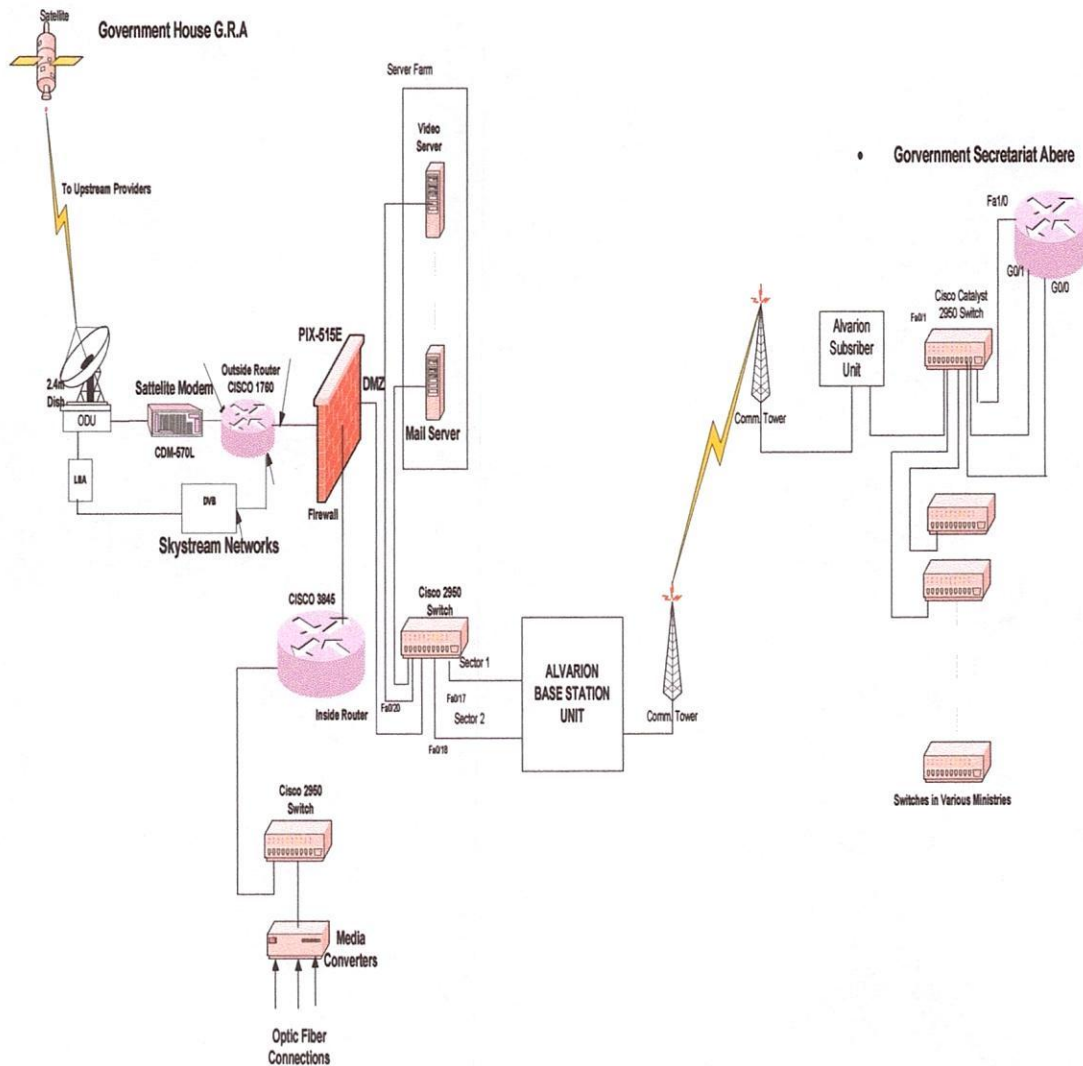
OSUN STATE GOVERNMENT AS BUILT NETWORK DIAGRAM


I. Internet Backbone Connectivity Services.

Internet access services backbone has been provided on the satellite communication technology called VSAT. The deployed VSAT operates on the C-band platform known to be less susceptible to rain attenuation. The VSAT also operates on a reliable frequency division multiple access satellite protocol technique. The VSAT ground element is configured to provide a 24 / 7 global Internet connectivity to the State Government Computer Network. The primary Network Operation center is energized by the power supply from Solar Panels / Wind Turbines Power System support by PHCN, and a 100KVA Generating set, backed up by 24hr power autonomy from deep circle set of Batteries and Inverters. The VSAT ground element and electronics were designed to support up to 4Mbps by 2Mbps.

Internet Backbone Cloud

LMI-1 Transponder

1761 Gateway Router

2.4 M ESA

5W BUC

Comtech CDM570-L Modem

Norsat LNB

SKYSTREAM DVB

II. Metropolitan Area Network

The internet traffic and the state –wide mission critical information centrally located at the IT Bureau are routed to some remote locations within Osogbo metropolis via a high capacity IP services oriented point - to - multipoint broadband wireless access system to provide 11 Mbps air-interface connectivity to these places. The remote locations connected over this fixed wireless access radio include Osun State House of Assembly Complex, Osun state Broadcasting Corporation and Osun State Secretariat at Abere , and some official quarters. The base station radio consists of transceivers and 120° sectorized antennas. The radios operate in the unlicensed frequency band in Time Division Duplex (TDD) mode using

Orthogonal Frequency Division Multiplexing (OFDM) modulation with Forward Error Correction (FEC) coding .Using the enhanced multi-path resistance capabilities of OFDM modern technology, the radio enables operation in near and non-line of sight (NLOS) environments. This quality is considered valuable to reach the inaccessible and broader segment of the targeted users now and in future. The Metropolitan Area Network was designed to accommodate seamless expansion.

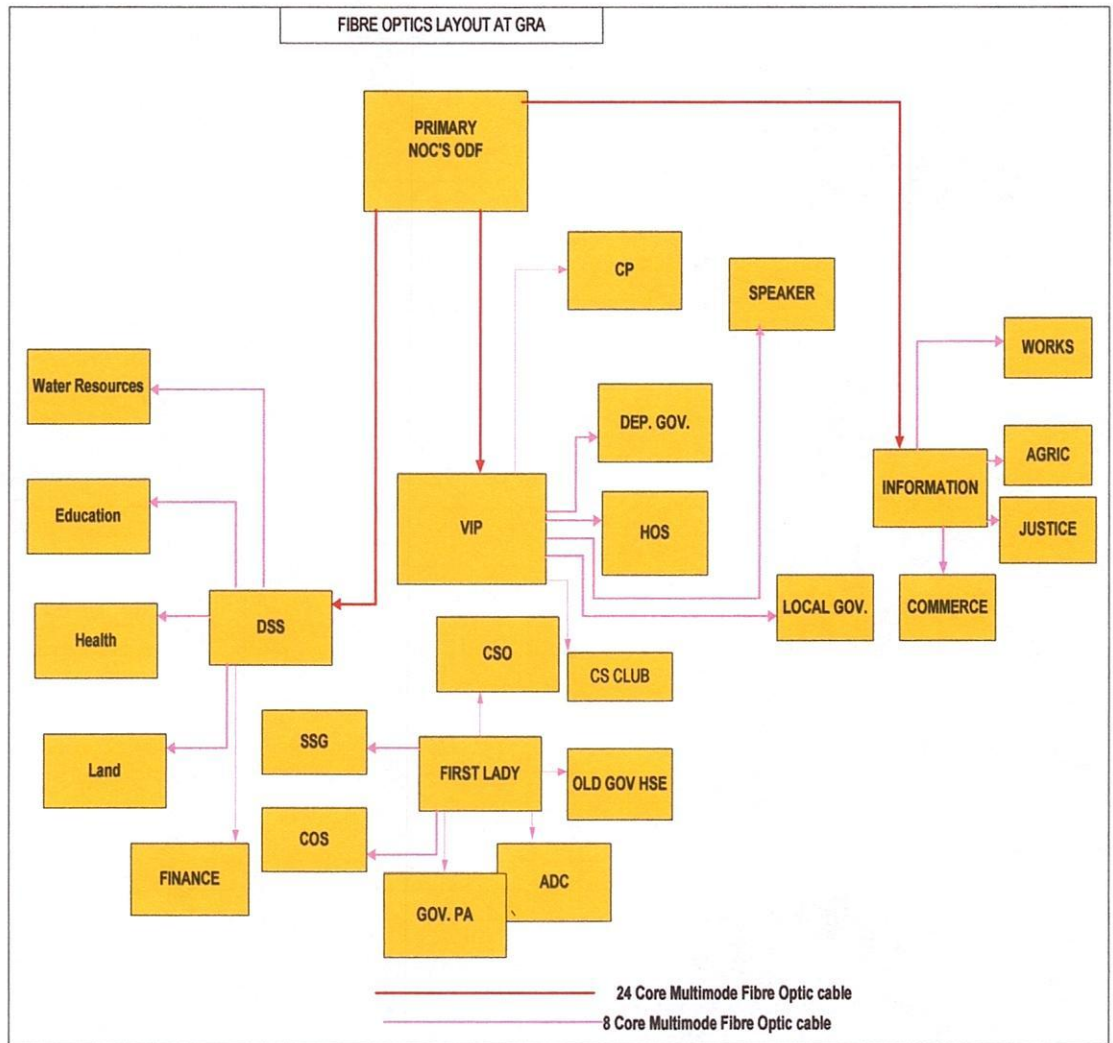DETAILED MAN Network for Osun State
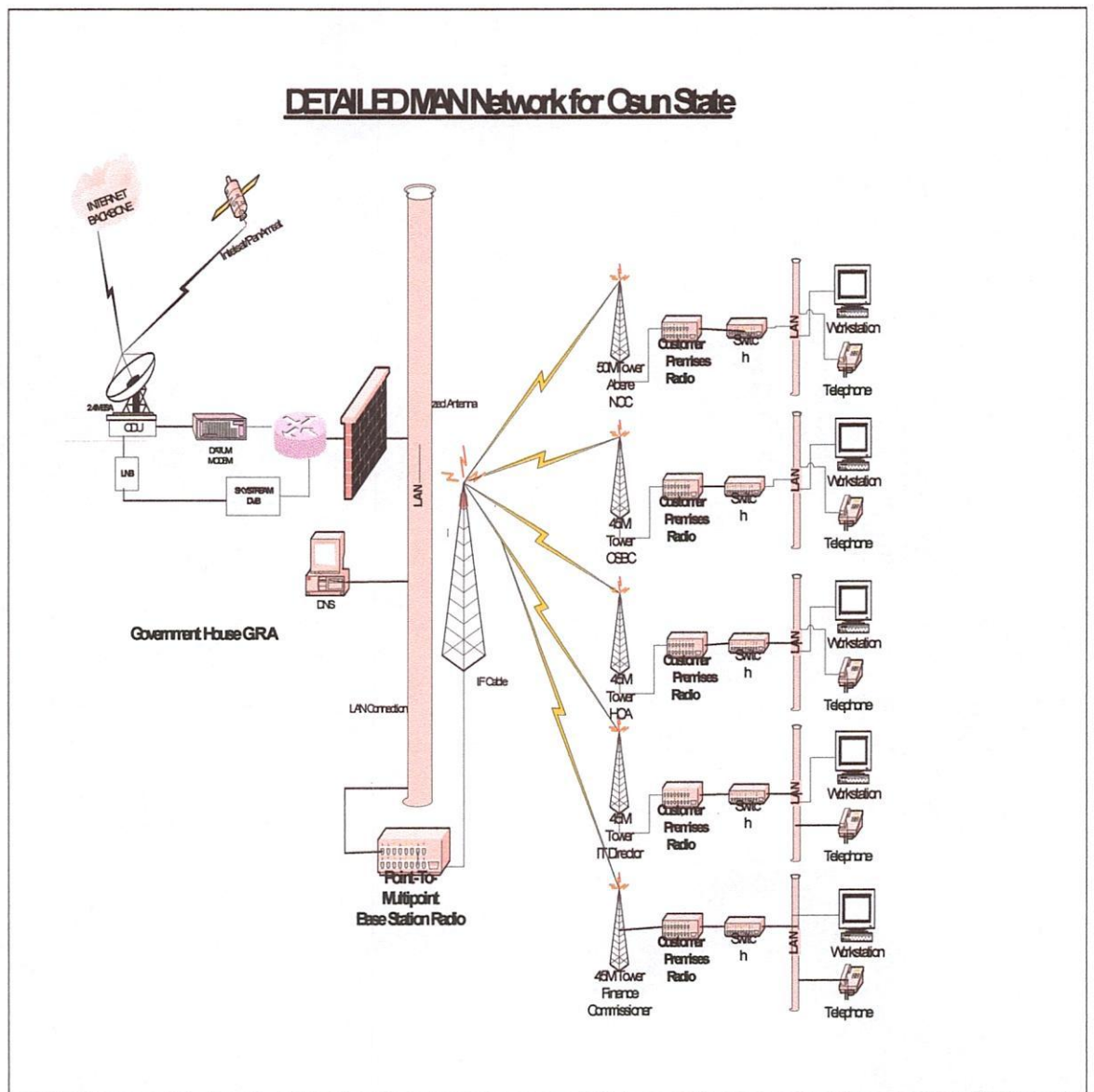
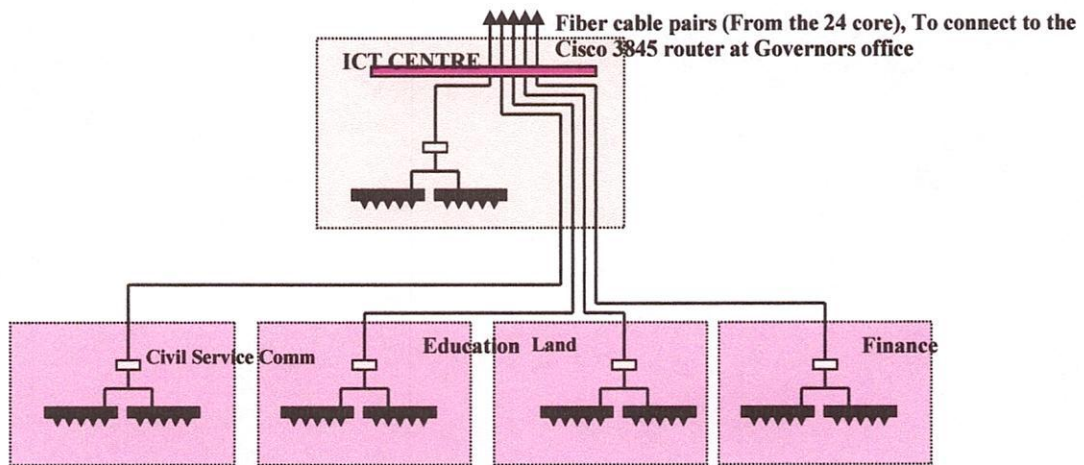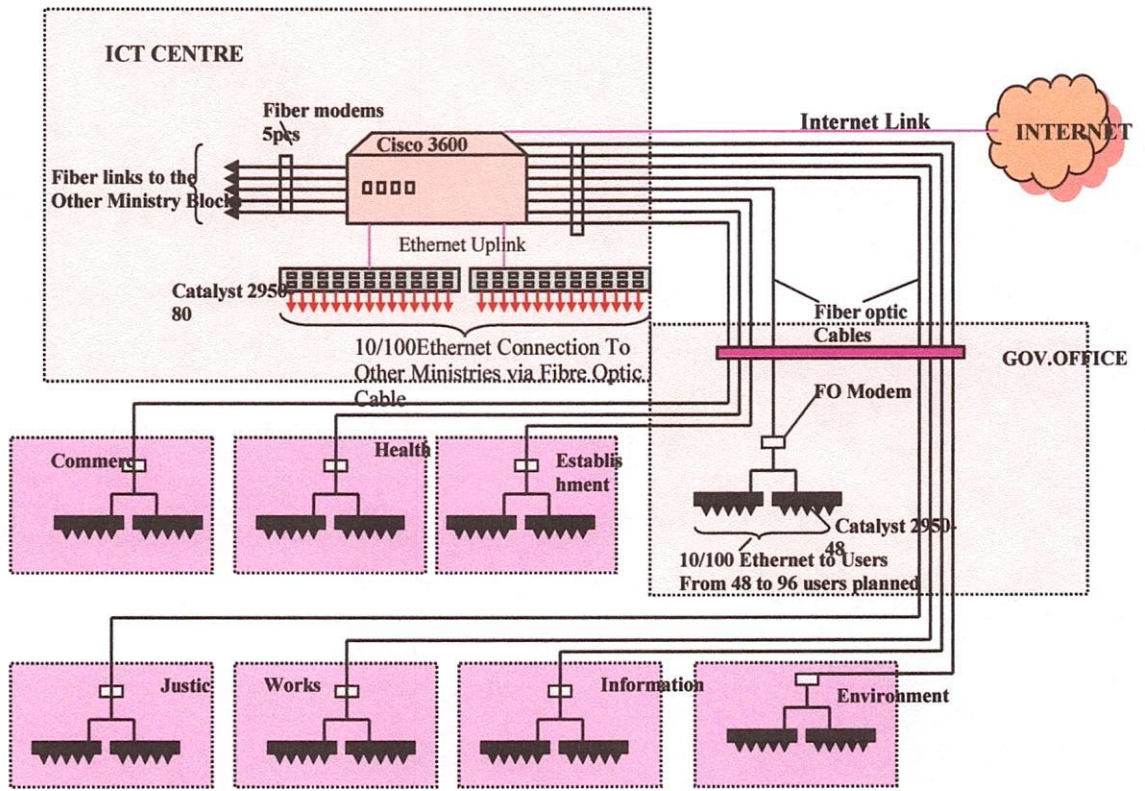III. Local- Fibre Optic Transmission Backbone Network at State Secretariat.

The state government has deployed a backbone transmission network based on fibre optic transmission to provide connectivity between Network operation centre at Abere Secretariat and all Ministries / parastatal /Agencies. The fibre optic cable's resilience, ability to transmit data at higher transmission rate and with lower losses informed the state government subscribing to this enduring transmission system. At Abere three 24 core multimode fibre cable were laid and terminated as primary cable at two Optical Distribution frame points. Secondary fibre cables were cross connected at these distribution points to feed various ministries and agencies within their vicinities. Both the primary and secondary fibre cables that constitute the transmission backbone network are designed and configured to be in high redundancy mode to facilitate easy expansion and recovery in case of any failure.

Legend:
- 24 Core Multimode Fibre Optic cable
- 8 Core Multimode Fibre Optic cable
- 4Core Multimode Fibre Optic cable
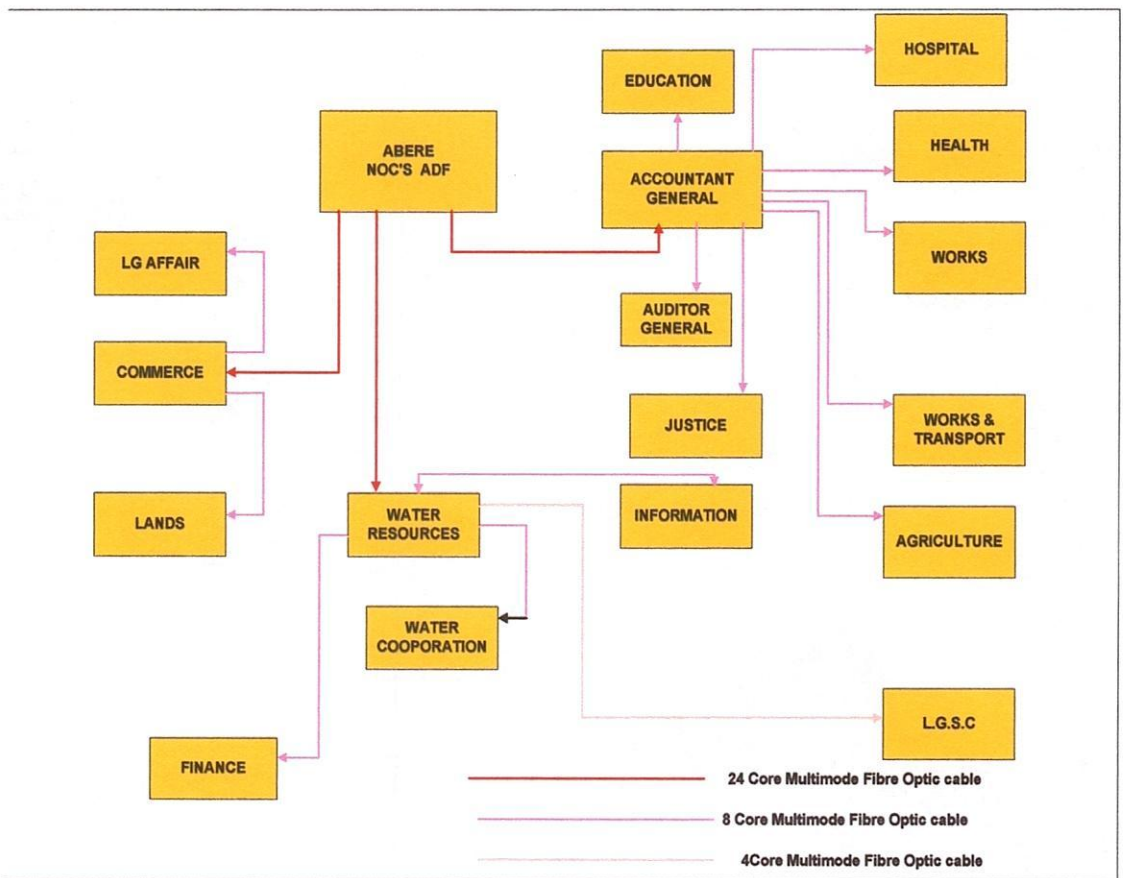
IV. Local - Fibre Optic Transmission Backbone Network at GRA.

The failure-proof and resilience properties of Fibre Optic Cable as earlier discussed above made the state government to implement a fibre transmission backbone network at Government Reservation Area to provide highway Internet and intranet traffic access to the top government functionaries. In this transmission segment, the primary and secondary fibre cables were also configured in high redundancy mode for easy expansion and recovery in case of any failure. The detailed transmission network at GRA is as shown in the GRA Fibre Distribution Diagram.

FIBRE OPTICS LAYOUT AT GRA

ICT CENTRE

Fiber modems 5pcs

Fiber links to the Other Ministry Blocks

Cisco 3600

Internet Link — INTERNET

Ethernet Uplink

Catalyst 2950 80

10/100Ethernet Connection To Other Ministries via Fibre Optic Cable

Fiber optic Cables

GOV.OFFICE

FO Modem

Catalyst 2950 48

10/100 Ethernet to Users From 48 to 96 users planned

Commerce · Health · Establishment

Justice · Works · Information · Environment

Fiber cable pairs (From the 24 core), To connect to the Cisco 3845 router at Governors office

ICT CENTRE

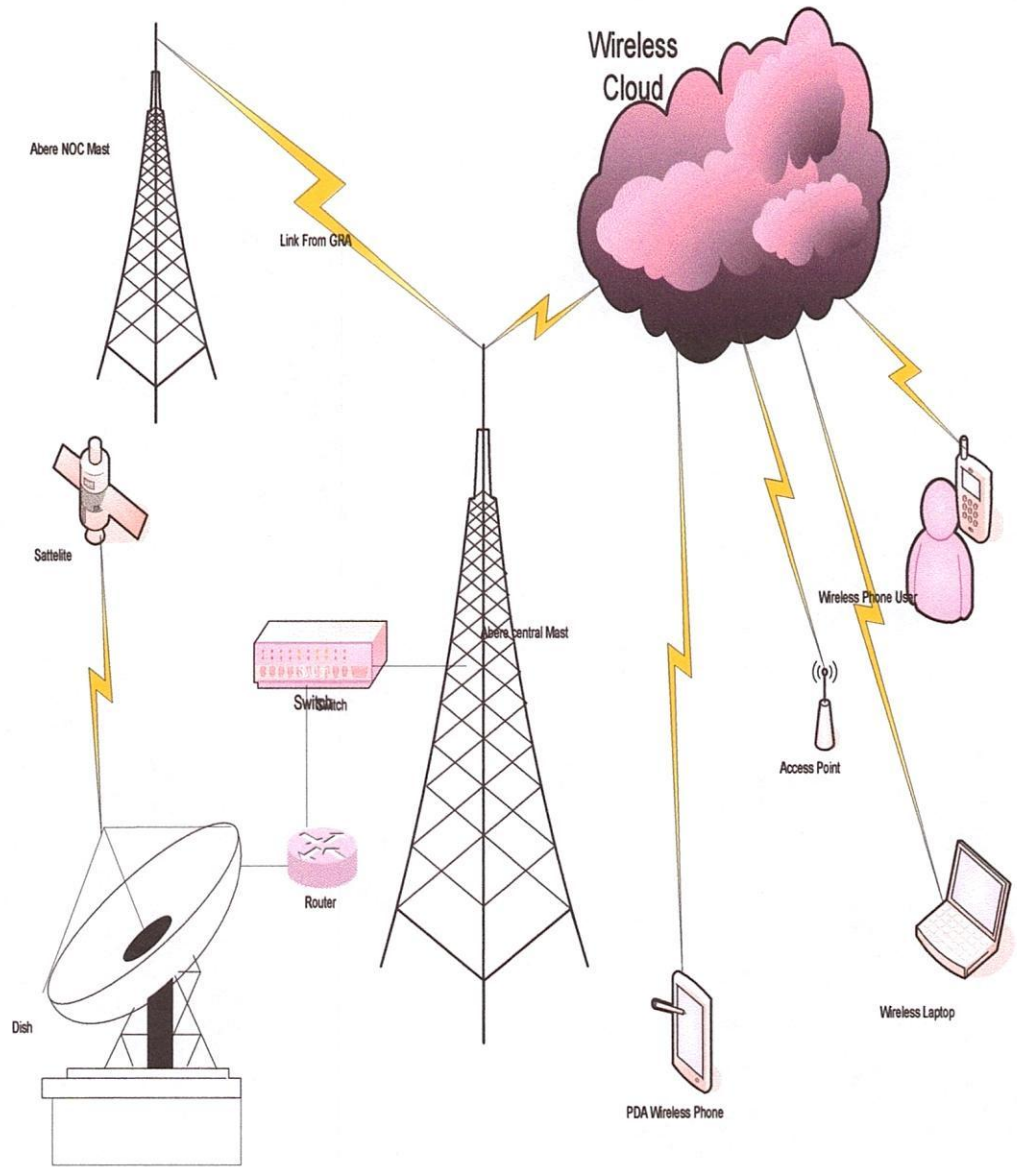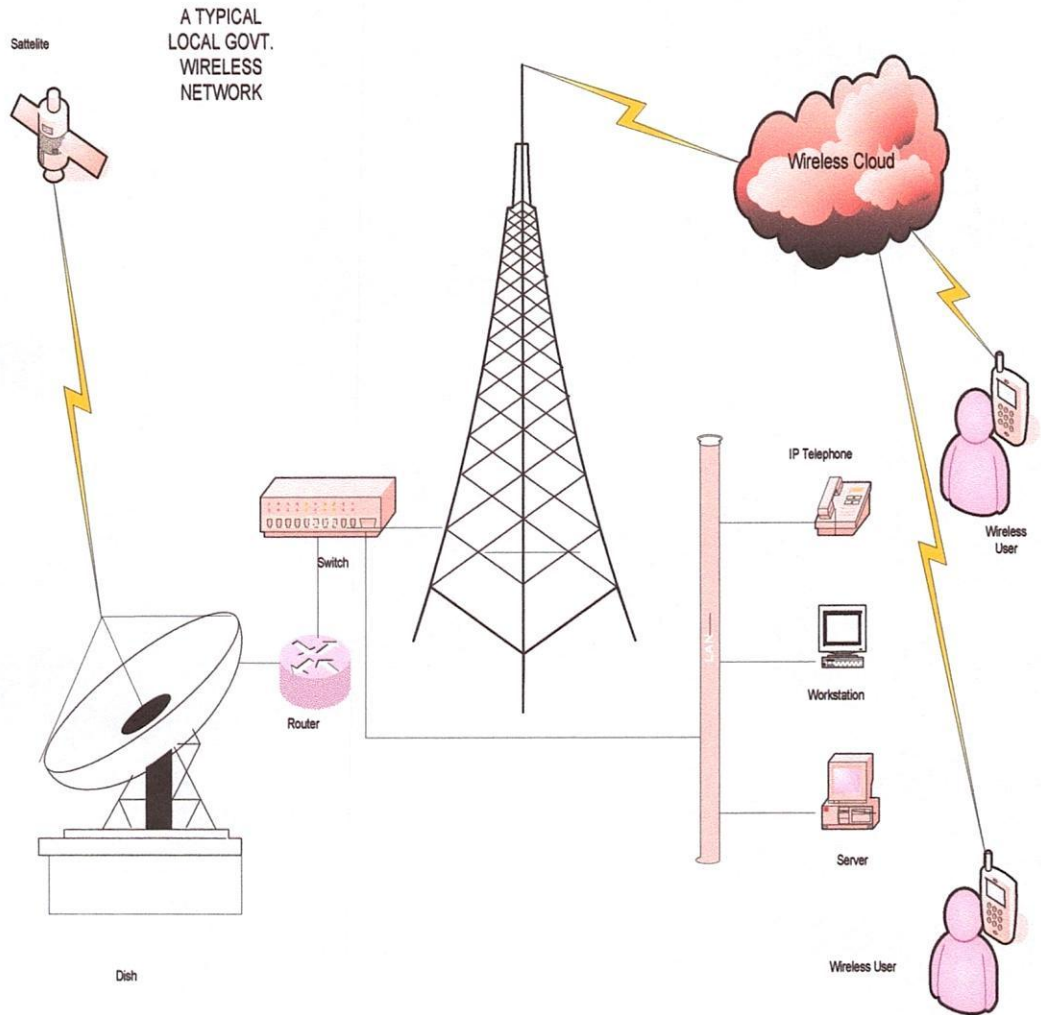Civil Service Comm · Education · Land · Finance

V. Local Area Network at Abere Secretariat.

The state government has provided a model LAN engineering in each Agency to provide user connectivity to at least three designated topmost government officials in that Agency and the IDF room. The LAN engineering is provisioned on Ethernet access architecture.
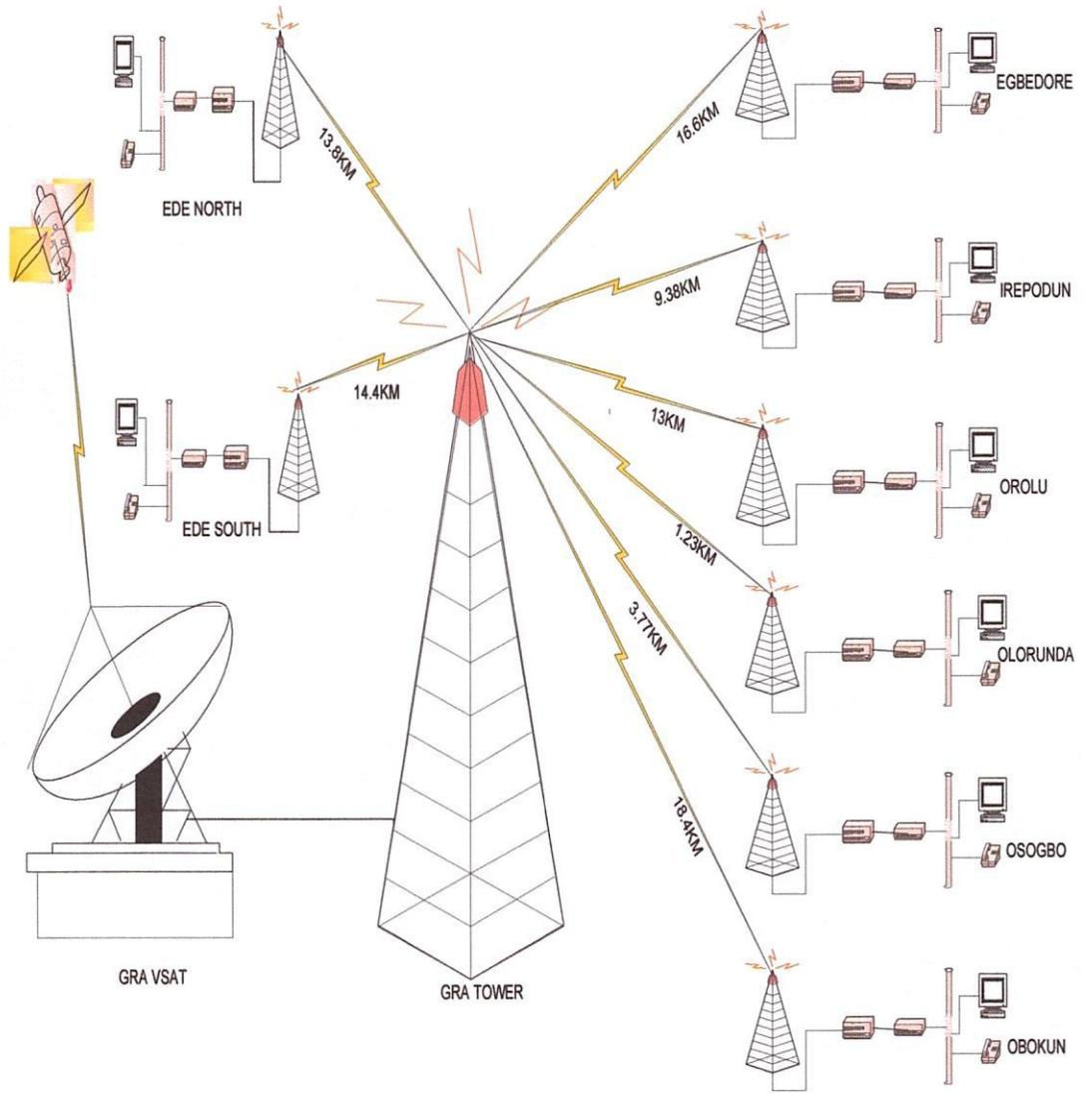
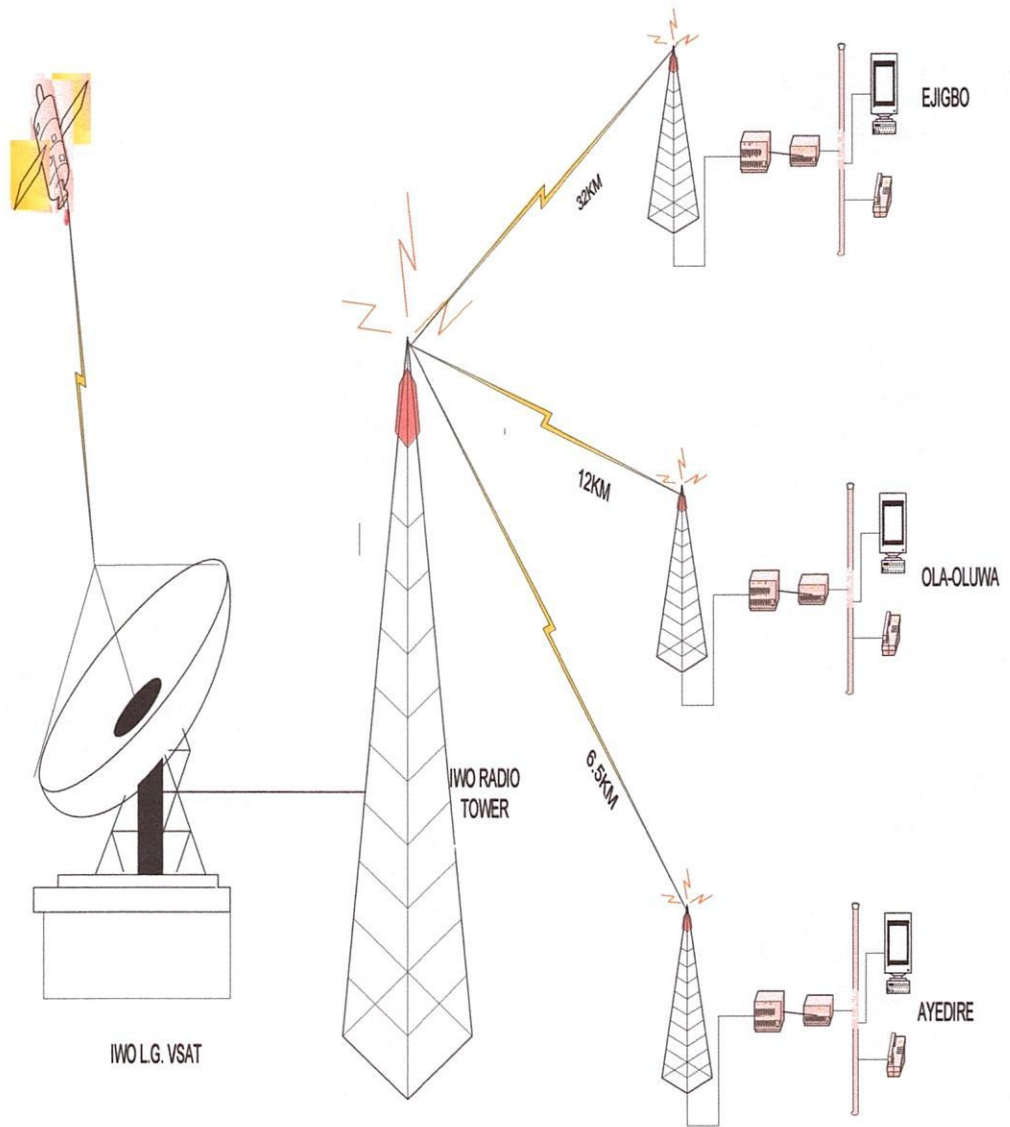## VI. CAMPUS METROPOLITAN WIRELESS NETWORK IN ABERE
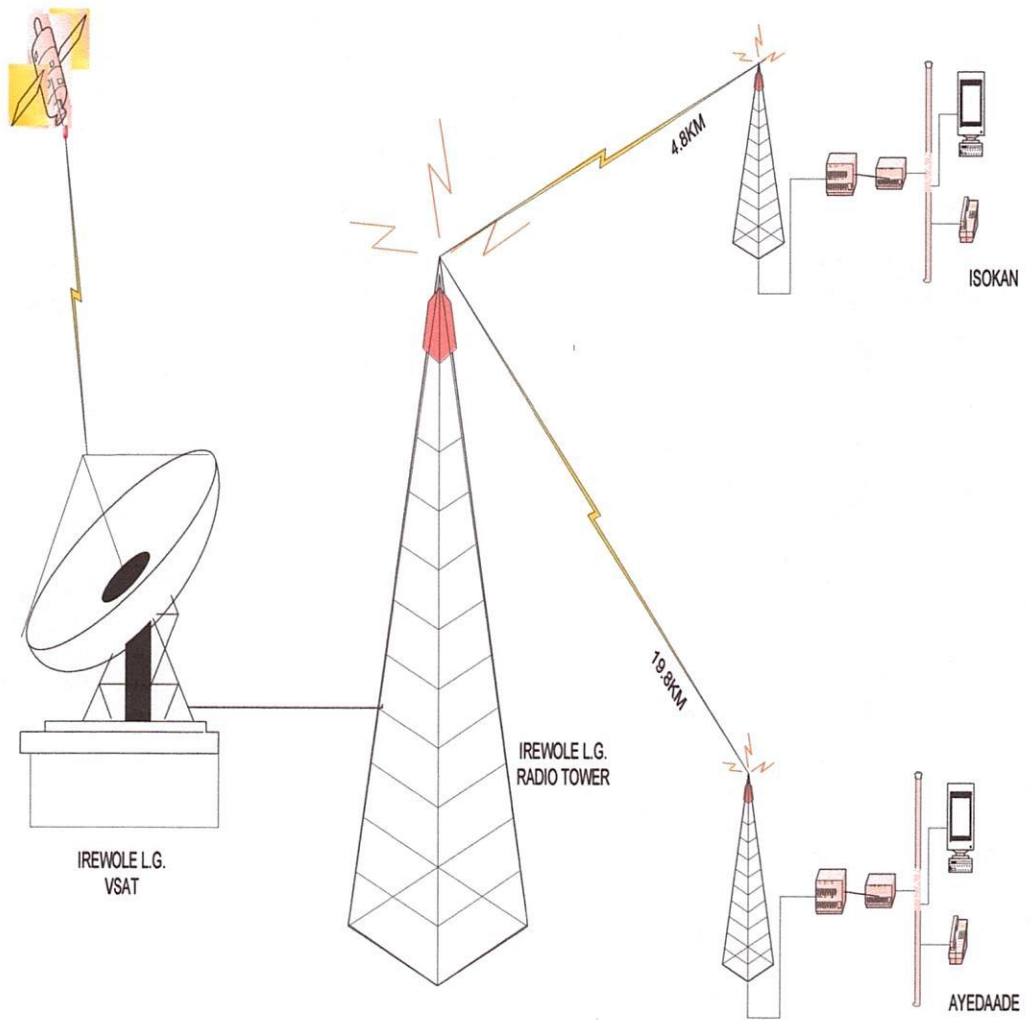
VII.   A TYPICAL LOCAL GOVERNMENT WIRELESS NETWORK

A TYPICAL
LOCAL GOVT.
WIRELESS
NETWORK

Sattelite

Wireless Cloud

IP Telephone

Switch

Router

Workstation

Server

Wireless
User

Dish

Wireless User

GRA WIRELESS GROUPS

EDE NORTH

EDE SOUTH

GRA VSAT

GRA TOWER

13.8KM

16.6KM

9.38KM

14.4KM

13KM

1.23KM

3.77KM

18.4KM

EGBEDORE

IREPODUN

OROLU

OLORUNDA

OSOGBO

OBOKUN

IWO WIRELESS GROUPS

EJIGBO

32KM

12KM

OLA-OLUWA

6.5KM

IWO RADIO
TOWER

AYEDIRE

IWO L.G. VSAT

IREWOLE LOCAL GOVERNMENT
WIRELESS GROUPS

4.8KM

ISOKAN

19.8KM

IREWOLE L.G.
RADIO TOWER

IREWOLE L.G.
VSAT

AYEDAADE

IFE CENTRAL LOCAL GOVERNMENT
WIRELESS GROUPS

IFE AREA OFFICE

IFE CENTRAL L.G.
VSAT

IFE CENTRAL L.G.
RADIO TOWER

20.9KM — AYEDAADE

15.9KM — IFE NORTH

8.05KM — IFE EAST

7.6KM — ATAKUMOSA WEST

40KM — IFETEDO
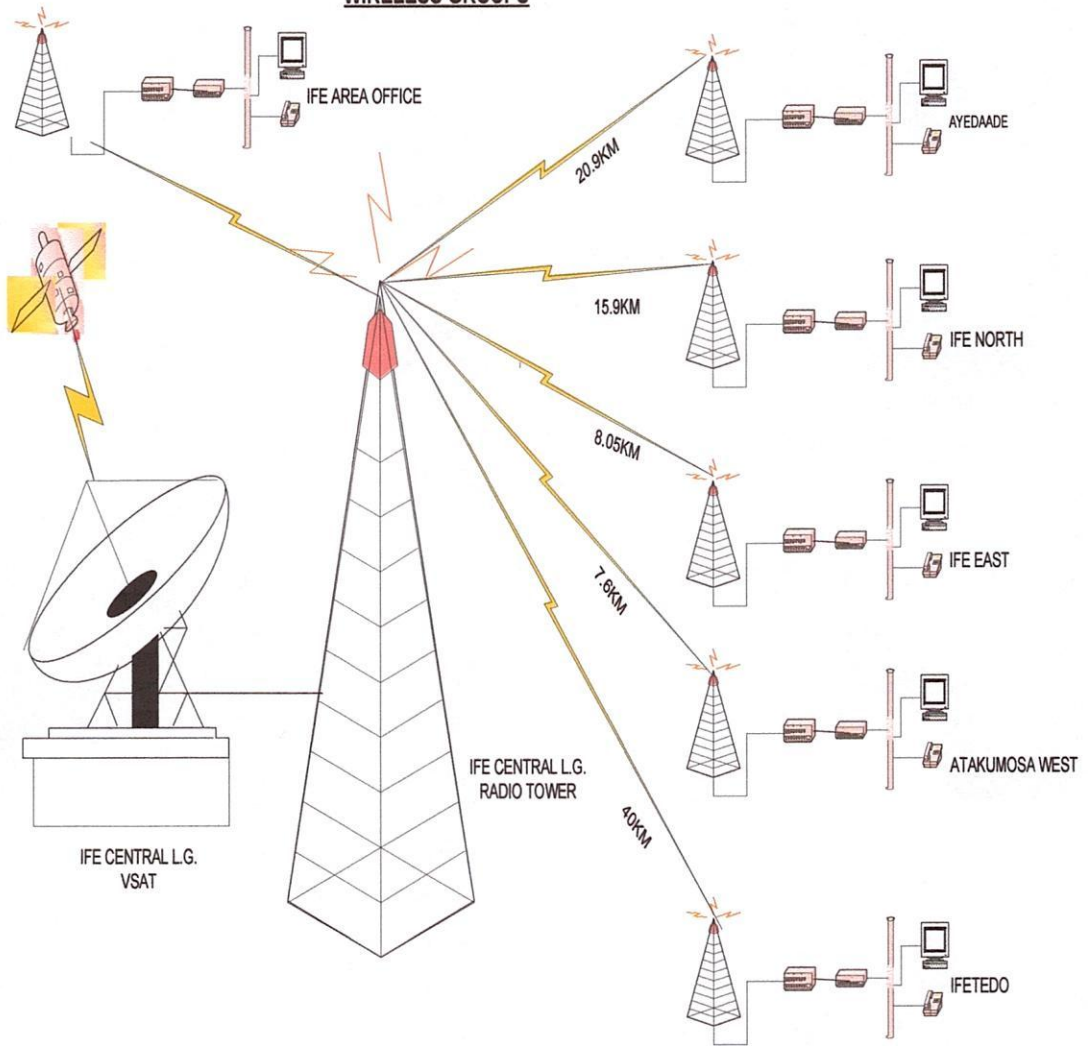
ILESA WEST LOCAL GOVERNMENT
WIRELESS GROUPS

ILESA WEST L.G.
VSAT

ILESA WEST L.G.
RADIO TOWER

13.2KM — ATAKUMOSA WEST

16.7KM — ATAKUMOSA EAST

2.94KM — ILESA EAST

9.9KM — ORIADE

18.1KM — OBOKUN
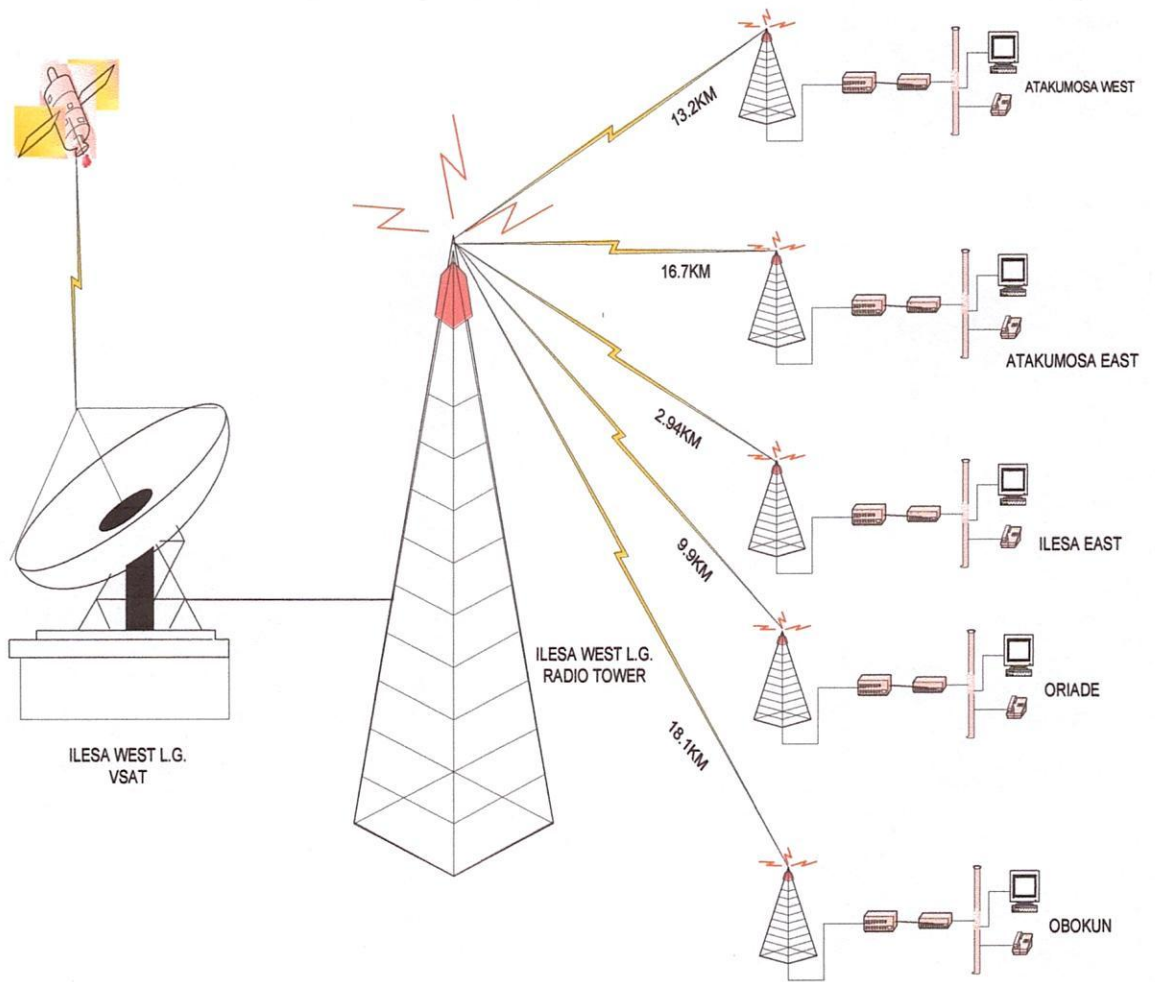
IFELODUN WIRELESS GROUPS

IFELODUN L.G.
VSAT

IFELODUN L.G.
RADIO TOWER

13.2KM

4.3KM

ODO-OTIN

BORIPE
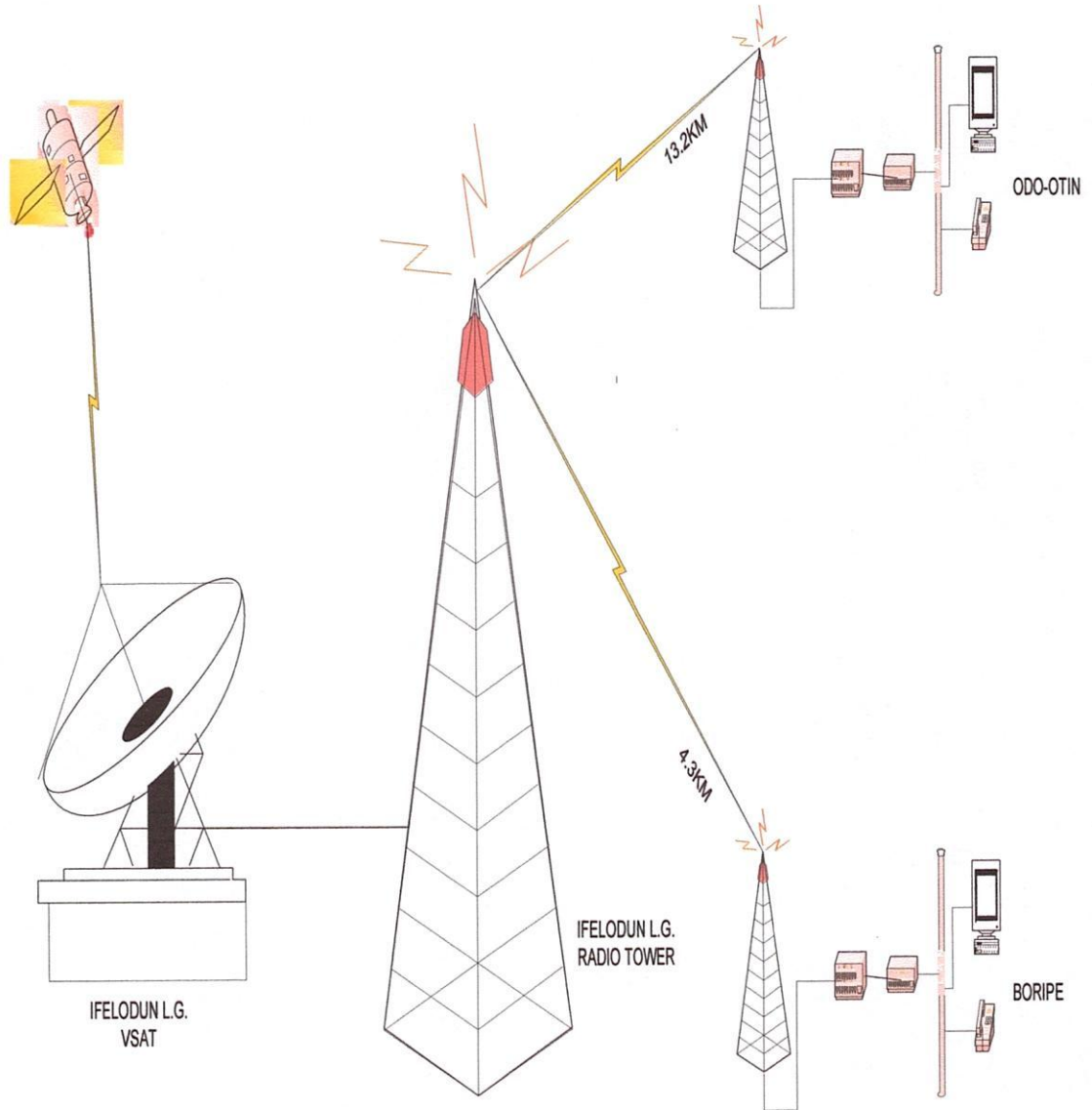
6.0   PROSPECTS

(i)   Eventual Introduction of e-Government

The introduction of ICT infrastructure in Osun State has no doubt signaled the a successful commencement of a journey to e-Governance. This development will not only bring about transformation in the government processes and procedures but there shall be a corresponding revolution in the relationship existing between the governed and the government.

(ii)   Harnessing the State Human and Natural Resources

The human and natural endowment of the state resources were harnessed and enhanced with the advent of ICT in Osun State. Our rich cultural heritage, for example, is now receiving international attention and due focus while through interaction with global internet connectivity, our people can properly harness their talents and potential optimally.

(iii)   Youth Educational Development

Information and communication technology as a vehicle for service delivery will bring desired information to the doorstep of the youth which will consequently increase their knowledge base to successfully connect with their peers in the other part of the world.

(iv)   Creation of Business Opportunity

The advent of ICT in Osun State will attract foreign investors to partner with the state or individual to enhance the government and citizenry wealth base. This is a strategic decision designed to reposition the state and bring us to the frontiers of a new economic and technological order, create job opportunities, stimulate investment and consumption and consequently boosting the State economy.

7.0   CHALLENGES

The State is grossly being challenged with inadequate funds to finance her ICT initiatives. The State is one of those at the bottom of ladder in terms of funds allocation from the Federation Account and with very – low IGR. The situation is worsened with the global economic meltdown. It is a common knowledge that ICT initiative, world over, generally requires huge investments and expertise; hence we need to partner and work with private sector organizations through a Public Private Partnership Arrangement (PPPA) to bring about the realization of

this strategic initiative of the Government. The inclusion of the private sector in this project aims at improving the quality of service provided to the citizens, alleviating the burden on the State's financial resources without impairing the State's ability to provide the necessary services at fair social prices. Therefore, this new dawn may require a new legal framework for it to succeed.

8.0 CONCLUSION

There is no doubt that the challenges facing the evolution, development, deployment and total embracement of ICT as a tool for socio-economic development, most especially in the public service environment like Osun State, are very enormous and could be intimidating; there is no gain saying the fact that the adoption of ICT in the governance of the state offers several numerous corresponding advantages and prospects which will have positive consequential effects in boosting the State economy.

Although, Osun State has just begun a journey of several years, the paradigm shift is already taking place and there is hope that the future of ICT development and e-Government in the state is very bright and promising.