Nigerian National Broadband Plan 2020 – 2025

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GLOSSARY

Acronyms	Description
2G	Second Generation Telephone Wireless Technology
3G	Third Generation Telephone Wireless Technology
4G	Fourth Generation Telephone Wireless Technology
5G	Fifth Generation Telephone Wireless Technology
A4AI	Alliance for Affordable Internet
ADB	African Development Bank
ADI	Affordability Drivers Index
ALTON	Association of Licensed Telecommunications Operators of Nigeria
ATCON	Association of Telecommunication Companies of Nigeria
ASCON	Association of Submarine Cable Operators of Nigeria
BCDA	Border Communities Development Agency
CBN	Central Bank of Nigeria
CCTV	Closed-Circuit Television
CNI	Critical National Infrastructure
CoS	Class of Service
DCNI	Department of Critical National Infrastructure
DML	Digital Mobile Licensing
EUC	End User Certificate
FCTA	Federal Capital Territory Administration
FCCPC	Federal Competition and Consumer Protection Council
FMCT	Federal Ministry of Communications Technology *Subsumed to FMoCDE
FMoCDE	Federal Ministry of Communications & Digital Economy *Renamed in 2019
FMFBNP	Federal Ministry of Finance, Budget & National Planning
FMHDSD	Federal Ministry of Humanitarian Affairs, Disaster Management & Social Development
FME	Federal Ministry of Education
FMP	Federal Ministry of Power
FMT	Federal Ministry of Transport
FMW&H	Federal Ministry of Works and Housing
FTTx	Fibre To The x (where x could be Base station, Home, Tower, Building etc.)
FWA	Fixed Wireless Access
GBB	Galaxy Backbone
GDP	Gross Domestic Product
GSM	Global System for Mobile Communications
GSMA	GSM Association
HM FMoCDE	Honourable Minister, Federal Ministry of Communications & Digital Economy
ICT	Information and Communications Technology
ITU	International Telecommunication Union
IXP	Internet Exchange Point
JTB	Joint Tax Board
KPI	Key Performance Indicator
LGAs	Local Government Areas
MDAs	Ministries, Departments, and Agencies
MNOs	Mobile Network Operators

Acronyms	Description
MOFI	Ministry of Finance *Subsumed to FMFBNP
MPR	Ministry of Petroleum Resources
NBC	National Broadcasting Commission
NBP	National Broadband Plan
NBS	National Bureau of Statistics
NCC	Nigerian Communications Commission
NFMC	National Frequency Management Council
NIGCOMSAT	Nigerian Communications Satellite Company
NITDA	National Information Technology Development Agency
NIWA	National Inland Waterways Authority
NNPC	Nigerian National Petroleum Corporation
NRC	Nigerian Railway Corporation
NSCDC	Nigeria Security and Civil Defence Corps
NSIP	Nigeria Social Investment Programme
ONSA	Office of the National Security Adviser
OEM	Original Equipment Manufacturer
OECD	Organization for Economic Cooperation and Development
PEBEC	Presidential Enabling Business Environment Council
PMO	Project Management Office
POA	Point of Access
QoS	Quality of Service
RoW/ROW	Right of Way
SIM Card	Subscriber Identity Module Card
SMART	Specific Measurable Achievable Realistic Time-bound
TCN	Transmission Company of Nigeria
TVWS	Television White Spaces
USPF	Universal Service Provision Fund
VPN	Virtual Private Network

PRESIDENT'S MANDATE

PRESIDENT,
FEDERAL REPUBLIC OF NIGERIA

By Presidential directives, the Honourable Minister of Communications and Digital Economy inaugurated the Nigerian National Broadband Plan 2020-2025 Presidential Committee on Monday 16th December, 2019. The Committee, made up of industry stakeholders and representatives of key Government Agencies, supported by non-Governmental and Civil Society Organisations along with Development Partners, worked assiduously in producing this document

As we continue with our efforts of diversifying our economy, the need for ubiquitous broadband access cannot be overemphasized. We are aware of the economic growth opportunities afforded by the deployment of broadband technologies. I am told that every 10% increase in broadband penetration results in about 2.6% to 3.8% growth in GDP. This informed the Government's decision on the renaming of the Federal Ministry of Communications to the Federal Ministry of Communications and Digital Economy in October, 2019 as well as the unveiling of the National Digital Economic Policy and Strategy in November of the same year.

I note with keen interest that this plan is designed to deliver data download speeds of about 25Mbps in urban areas and 10Mbps in rural areas. It also targets covering at least 90% of the population and penetration rate of 70% by the end of the plans lifetime.

Although progress has been made in realizing some of the targets set in the previous plan, several factors militated against their full attainment. There is the need for deliberate efforts by all stakeholders towards ensuring that the targets we set ourselves in this plan are realized. I am therefore pleased to note that a governance framework aimed at facilitating this has been carefully crafted as part of the plan's implementation strategy. I also note the concerns expressed as to the factors that may militate against the attainment of these targets. Government, on its part, will create the enabling environment as well as relevant policies to ensure effective deployment and protection of telecommunications infrastructure. I have already directed the Honourable Minister of Communications and Digital Economy to work with the National Security Adviser, the Inspector General of Police and relevant government agencies to ensure the protection of these critical national assets.

I commend the Honourable Minister of Communications and Digital Economy, the Presidential Committee and all stakeholders who participated in the development of this Nigerian National Broadband Plan 2020-2025. As I present the plan, I look forward to the commitment of all stakeholders towards ensuring its full implementation.

Muhammadu Buhari
10th March, 2020

SPECIAL REMARKS BY THE MINISTER

On the 16th of December 2019, I inaugurated a Committee to draft a National Broadband Plan (NBP) for Nigeria (2020-2025) on behalf of His Excellency, President Muhammadu Buhari, GCFR. The Committee was made up of 32 industry experts and was chaired by Funke Opeke.

The development of a Broadband Plan aligns with global best practice and the constitution of the Committee is in line with the powers of the minister as stated in Section 23(a) of the Nigerian Communications Act 2003- the Minister shall be responsible for "the formulation, determination and monitoring of the general policy for the communications sector in Nigeria with a view to ensuring, amongst others, the utilization of the sector as a platform for the economic and social development of Nigeria."

The NBP addresses 3 of the 8 priorities that the Federal Government assigned to the Federal Ministry of Communications and Digital Economy, and the parastatals under its purview, for implementation. These priorities are the implementation of broadband connectivity and execution of a plan to deploy 4G across the country, as well as the development and implementation of a digital economy policy and strategy.

Broadband supports the development of the digital economy and a focus on growing the National Digital Economy will also improve and diversify the nation's traditional economy. This new broadband plan is designed to deliver data download speeds across Nigeria, a minimum of 25Mbps in urban areas, and 10Mbps in rural areas, with effective coverage available to at least 90% of the population by 2025 at a price not more than N390 per 1GB of data (2% of median income or 1% of minimum wage).

The implementation of the Plan will lead to creation of jobs, improved socio-economic development and sustained economic growth, amongst others. However, it is important to note that the successful implementation of the Plan requires synergy between government and the private sector. As such, this Plan has received input from all stakeholders and will be driven by the private sector, with the government providing the enabling environment.

As the President directed, I invite all stakeholders to fully support the implementation of the Plan as we seek to position our country to enjoy the benefits that ubiquitous nationwide broadband will provide.

Dr. Isa Ali Ibrahim (Pantami), FNCS, FBCS, FIIM
Honourable Minister
Federal Ministry of Communications and Digital Economy
(March 2020)

ACKNOWLEDGEMENTS

The FMoCDE wishes to thank all of the public and private sector stakeholders and industry leaders who made time to attend the various stakeholder sessions towards providing input to the National Broadband Plan. Participating organizations are listed in the Appendix.

In addition, the FMoCDE would like to thank the UK Government for their support through the Digital Access Programme. The FMoCDE would also like to thank the World Bank, A4AI, GSMA and Paradigm Initiative for their contributions.

The Ministry is grateful for the critical role that the parastatals under its purview have played in the successful preparation of the Plan.

The vision of affordable broadband for every Nigerian citizen is supported by your valued expertise and input.

1 EXECUTIVE SUMMARY

Nigeria is the largest mobile telecommunications market in Africa, largely based on rapid development following the successful auction of Digital Mobile Licenses (DML) in 2001. As at December 2019, the market served over 184 Million Mobile lines, with 126 Million of those lines connected to Internet services. According to the NCC, telecommunication services in the country have grown from a tele-density of lower than 1% on fixed wireline and wireless networks before the DML auctions, to reach approximately 89% population coverage for voice services in 2019 primarily based on 2G/2G+ networks.

Internet services in the country are currently provided on 2G, 3G, and increasingly 4G mobile networks. However, though 4G coverage is available to 37% of the population, download speeds in the country are noted to be generally uncompetitive with other countries in the same income bracket.

In recognition of the tremendous economic growth opportunities afforded by the deployment of broadband technologies, Nigeria established its first broadband plan in 2013 for a period of five years. The plan set out to achieve broadband access, defined as minimum download speeds of 1.5Mbps with at least 30% coverage, and an objective of achieving 3G coverage to at least 80% of the population. Given the current state of technology, development and applications of broadband technology, the 30% penetration achievement lags the aspiration of the country as the developed world marches towards widespread deployment of 5G technologies, while the country is yet to achieve significant 4G coverage and adoption.

In the June 12, 2019 Democracy Day address, President Muhammadu Buhari made a pledge to lift 100 Million Nigerians out of poverty in 10 years. In October 2019, to further the achievement of this objective, he expanded the mandate of the Ministry of Communications to address the development of the Digital Economy in line with the Economic Recovery and Growth Plan (ERGP) with focus on accelerating growth and social inclusion.

Digital technology offers Nigeria the opportunity to grow and diversify its economy from the overdependence on oil & gas export proceeds. With a teeming population estimated at 203 Million according to the United Nations (UN), where over half of the population is under 25 years of age, the country is faced with the tremendous challenge to put this largely unemployed and underemployed population to work.

Rapid rollout of broadband services will address various socio-economic challenges faced by the country, including the need to grow its economy, create jobs, rapidly expand the tax base, and improve digital literacy and educational standards. This will also address identity management and security challenges through the effective use of technology, increase financial inclusion and deliver a broad range of services to its people to improve the quality of life and work towards attainment of Social Development Goals set by the UN for 2030.

The Honourable Minister of Communications and Digital Economy, Dr. Isa Ali Ibrahim Pantami has responded to this mandate with the development of a National Digital Economy Policy and Strategy, which was unveiled by the President in November 2019. The strategy identifies eight (8) critical pillars namely; Developmental Regulation, Digital Literacy and Skills, Solid Infrastructure, Service Infrastructure, Digital Services Development & Promotion, Soft Infrastructure, Digital Society & Emerging Technologies and Indigenous Content Promotion & Adoption. The development of the Solid Infrastructure pillar forms the main focus of this Plan.

Therefore, the nation faces an urgent imperative to deploy a new Broadband Plan in line with these objectives, which have been proven in other countries to make a significant contribution to lifting citizens out of poverty.

The new Broadband Plan is designed to deliver data download speeds across Nigeria of a minimum 25Mbps in urban areas, and 10Mbps in rural areas, with effective coverage available to at least 90% of the population by 2025 at a price not more than N390 per 1GB of data (i.e. 2% of median income or 1% of minimum wage). In order to achieve these ambitious targets, the plan is focused on recommendations in 4 critical pillars as shown in Fig 1.1:

- Infrastructure
- Policy
- Demand Drivers
- Funding & Incentives

Fig 1.1: Nigerian National Broadband Plan

These objectives are detailed within the plan with priority initiatives highlighted in Table 1.0 below.

Table 1.0 Priority Initiatives

No.	Pillar	Initiative
1	**Infrastructure**	Critical National Infrastructure (CNI) – Issuance of Executive Order to Declare Telecoms infrastructure as CNI and full implementation of Plan
2	**Infrastructure**	Establish a coordinating body for Fibre Builds – to ensure open access, prevent overlap and facilitate RoW issuance at statutory rates
3	**Infrastructure**	Satellite – Leverage existing NIGCOMSAT infrastructure to reach unserved/rural areas
4	**Infrastructure/ Policy**	Implement and enforce national uniform RoW charges for fibre builds at a rate of N145/m and ensure Open Access/Accounting Separation
5	**Policy**	Base Station Site Acquisition – Work with States to implement One-stop Shop to accelerate approvals and harmonize fees

No.	Pillar	Initiative
6	**Policy**	Spectrum: Ensure efficient use of Spectrum; Use it or Lose It Policy, Open and transparent spectrum planning including TV White Space deployment for broadband
7	**Funding / Demand Drivers**	Affordability - Incentivize low cost smart phone devices and promote local assembly /manufacturing of Telecom network and end device components.
8	**Funding/ Demand Drivers**	Co-ordinate Government spending, Schemes and Programs to ensure access in public institutions e.g. schools, hospitals and MDAs

In an environment of constrained Government spending and significant expenditures focused on electricity and other infrastructure areas of the economy, the plan relies on being led and funded by the private sector to ensure its realization, coupled with appropriate incentives from Government. This would require better alignment of interests between industry players and the Government to achieve optimal success. Government will be required to provide necessary incentives to private sector players and to create a more enabling environment for existing operators and potential new investors to drive additional investment into broadband infrastructure and services in the country. Some of these efforts are already underway with progress towards the finalization of the Executive Order on Critical National Infrastructure Protection being quite advanced and significant positive engagement between the Honourable Minister of Communications & Digital Economy and the Nigerian Governors Forum on agreeing to hold RoW fees at N145/linear meter, contrary to the prevailing non-uniform fee regimes.

Nonetheless, the plan remains ambitious given the Capital requirements estimated at a range of $3.5- $5 Billion to achieve effective execution over the five year period of 2020 – 2025 and can only be achieved if Government and Private sector align and harmonize activities regarding spending and incentives to achieve optimal results.

This plan has been developed with the commitment of a wide range of Nigerians with expertise across the public and private sector and assistance from global institutions and industry partners. The plan also draws on the experience of over 150 countries who have developed similar plans which have been made available in the public domain, as well as significant work by the World Bank, the UN Broadband Commission, ITU and GSMA to assist countries in the development of their broadband plans.

The committee thanks the President, His Excellency Muhammadu Buhari, GCFR and the HM FMoCDE, Dr. Isa Ali Ibrahim Pantami for the opportunity to make this contribution towards ensuring that every Nigerian will have access to a minimum of 10 Mbps broadband connectivity services at a price not more than N390 per 1GB of data (2% of median income or 1% of minimum wage) by 2025.

Diligent implementation and adoption of an effective governance framework will ensure the realization of this plan.

2 BACKGROUND ON NIGERIA: ECONOMY, TELECOMS AND BROADBAND

Nigeria is the largest economy in Africa, with a nominal GDP as at Q4 2019 of approximately USD 445 Billion, accounting for about 20% of continental GDP, and a disproportionate 75% of the West African economy. Across the continent, Nigeria is followed by South Africa and Egypt at USD 371 Billion and USD 300 Billion respectively [ADB].

The country's economy is currently witnessing a period of slow growth, having gone through a major recession and currency devaluation arising from lower oil export prices in 2016. Nigeria is seeking to diversify its earnings away from over dependence on oil thus significant investments are being made in agriculture and infrastructure in line with its Economic Recovery and Growth Plan (ERGP) that seeks to accelerate growth in the economy and to reduce chronic rates of unemployment.

However, with an estimated population growth rate of 2.5%, much higher GDP growth rates will be required in order to lift 100 Million Nigerians out of poverty within 10 years in line with the President's commitment. Nigeria's GDP growth rate was 2.55% (Q4, 2019 NBS) Fig 2.1 and growth targets will need to rise to a significant percentage above inflation which has historically been in the low double digits in order to drive improved economic outcomes.

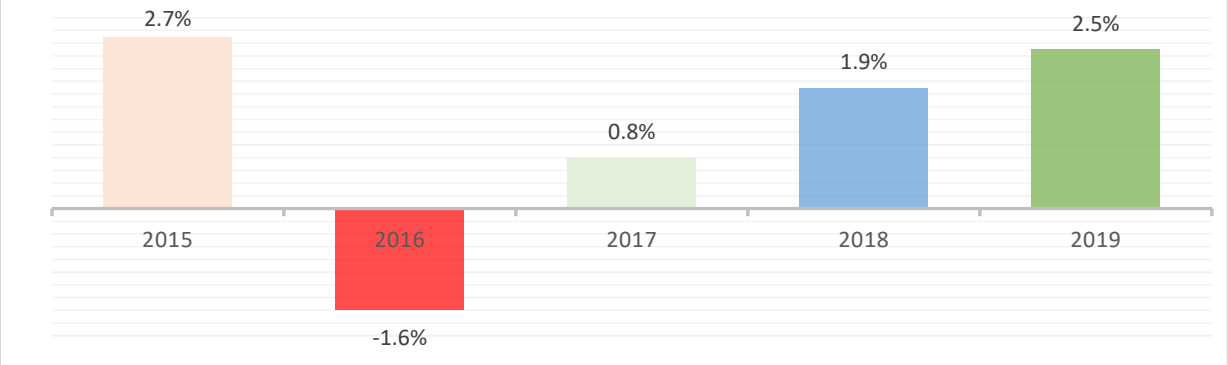


Fig 2.1: Nigeria's 2019 Real GDP Growth. Source: NBS

Nigeria's current population is estimated to be about 203 million according to the United Nations (UN), and this accounts for about 47% of West Africa's population.

The country's population continues to grow at a higher rate than the global average and is forecasted to grow from its current position as the world's 7th to the 3rd most populous country, approaching 400 Million people by 2050 as shown in Fig 2.2 below. Nigeria also has the largest youth population in Africa and 43% between ages of 0–14 (Fig 2.3). Unemployment is measured at 23% and youth unemployment at 55% per NBS 2018.

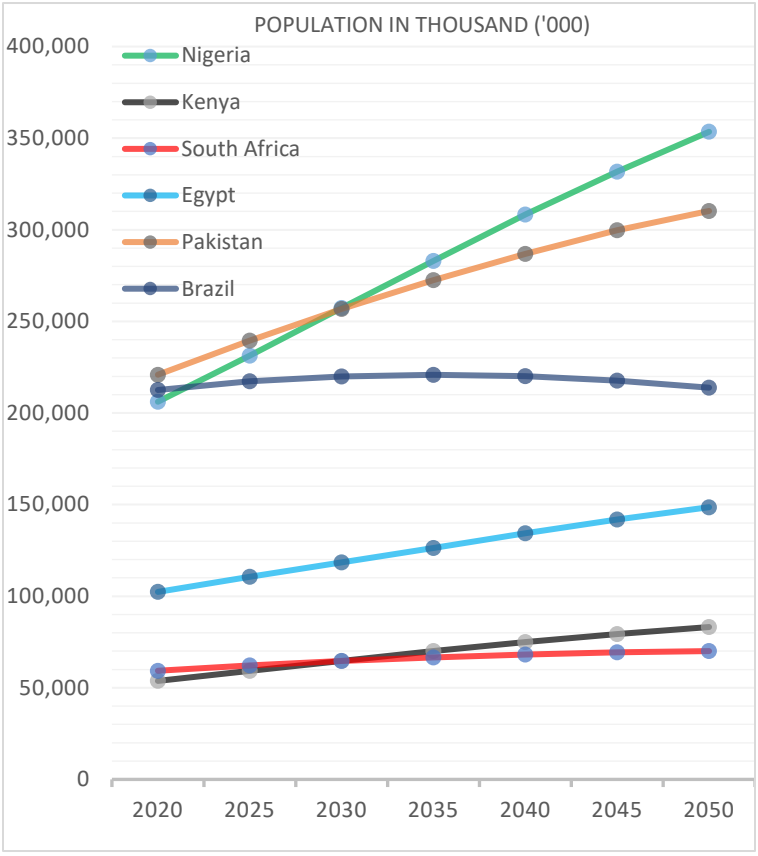


Fig 2.2: Nigeria's Population Growth Projection relative to other selected Countries 2020-2050 Source: UN Population Data

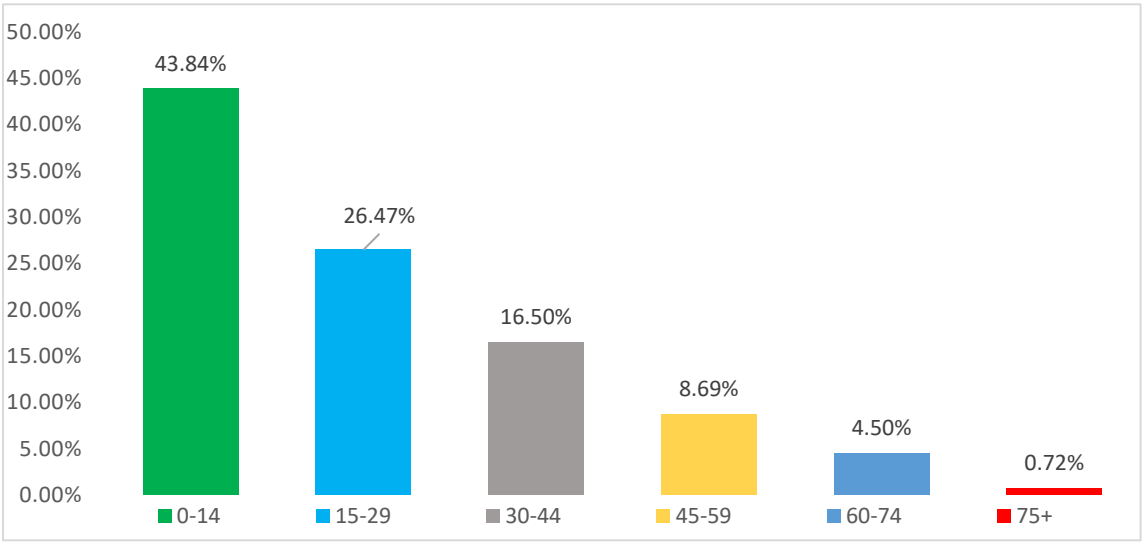


Fig 2.3: Nigeria's Population by Age group 2019
Source: [https://www.worldometers.info/demographics/nigeria-demographics/ (UN Data Extrapolation)](https://www.worldometers.info/demographics/nigeria-demographics/)

With the power of Information and Communications Technology (ICT) and its ability to transform quality of life and provide opportunities for the large, unemployed youth population, the country is uniquely positioned to reap a positive dividend from its population if it is able to harness the benefits of growing its Digital economy.

This adoption of a strategy to leverage Digital Technology for national economic development led the President to expand the role of the Minister of Communications to include the Digital Economy in October 2019. This strategy also recognizes that with the growing contribution of (ICT) to Nigeria's Gross Domestic Product (GDP), having risen to 13.9% at the end of Q3 2019; the sector is well positioned to create jobs and bring about the rapid transformation of the economy. Already, it is recognized that the Digital Economy will have broad sectoral impact as depicted in Fig 2.4 below.

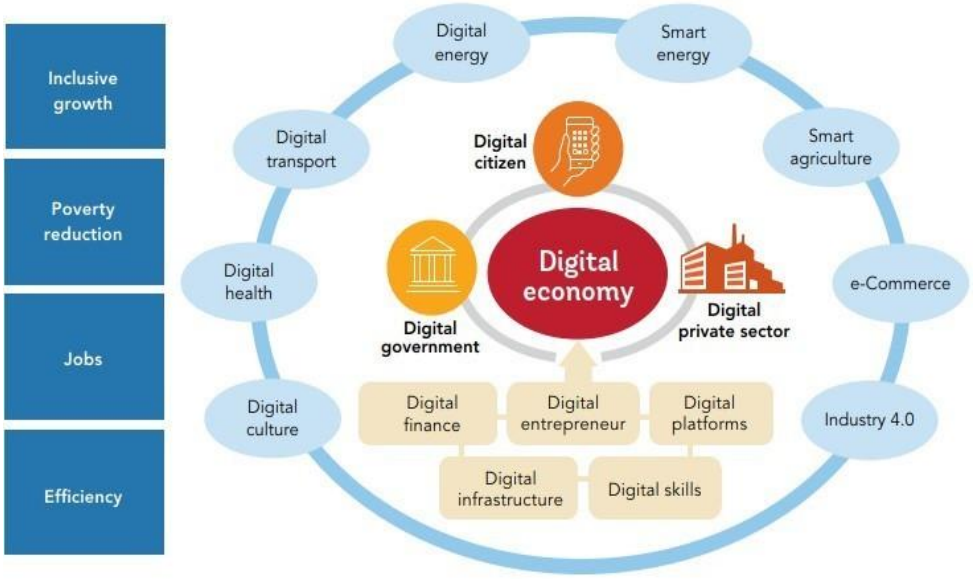


Fig 2.4: Sectors impacted by Digital Economy. Source: World Bank Digital Diagnostic for Nigeria 2019

In November 2019, President Muhammadu Buhari launched the National Digital Economy Policy and Strategy for a Digital Nigeria. The strategy is based on 8 key pillars aligned with the Economic Recovery and Growth Plan (ERGP) for the realization of a Digital Nigeria as shown in Fig. 2.5 below. One of the key pillars in the plan, is the development of Solid Infrastructure through the deployment of fixed and mobile broadband infrastructure to deepen broadband penetration in the country and drive the growth of an inclusive and vibrant digital economy.

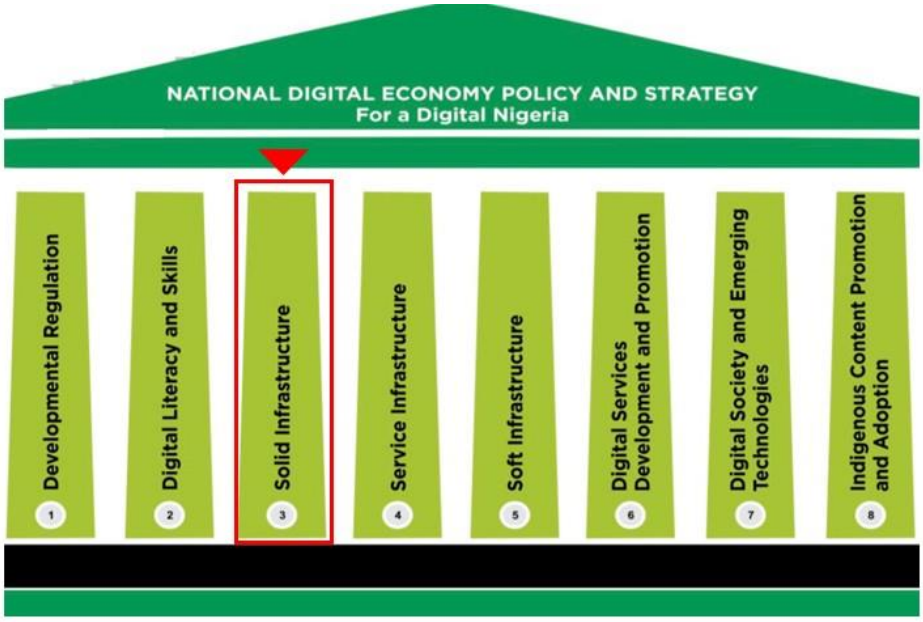


Fig 2.5: Nigeria's Digital Economy Policy and Strategy Plan. Source: Ministry of Communications and Digital Economy

The Policy thrust is ambitious and acknowledges that in the past few decades, Nigeria has faced an infrastructural deficit in the development of its economy with the inconsistency of electricity supply as a major bottleneck. This challenge continues to be a major inhibitor to economic growth and as the country sets out to grow its Digital Economy, it is acknowldged that power is a constraint that may inhibit achievement of overall plan objectives within the specified timelines. As such efforts to increase and stabilize electricity supply across the country are critical to the realization of this plan. This plan is therefore built upon the optimism that the various efforts currently being made by the Nigerian Government in partnership with recently privatized power generation and distribution companies will yield the desired objective of steady and affordable electricity supply to power the Digital Economy.

NIGERIA'S TELECOMMUNICATIONS SECTOR

Nigeria's telecommunications sector was fully deregulated in 2001. Prior to this, Nigeria had approximately 450,000 telephone lines provided by the Nigerian Telecommunications Limited (NITEL), and several private licensees operating networks with limited regional scope and services.

Liberalization of the sector ushered in a set of Global System for Mobile Communication (GSM) operators and the award of the first Digital Mobile Licenses by auction in 2001. According to the EVC/CEO of the NCC, at the Nigerian Telecom Leadership Summit held in May of 2019, the sector had witnessed an unprecedented surge in investments, with over $68 Billion flowing into the sector from 2001 to 2019.

Today, the Nigerian telecoms sector has grown to contribute 10.6% to GDP (NCC, Q4 2019), driven largely by four major Mobile Network Operators (MNOs) who provide services to over

99.5% of 184.7 Million active lines (NCC, December 2019) with 126 Million of those lines (68%), connected to the Internet (2G+/3G/4G). In addition to these four major operators, the country has an additional number of specialised service providers – Internet Service Providers (ISPs), Private network operators, International Gateway Providers, Value Added Services companies, and Tower companies actively participating in the sector and providing services across the telecoms value chain.

The 184.7 million mobile subscriptions as at December 2019 were distributed across the networks of MTN, Globacom, Airtel and 9Mobile, each having 37.31%, 28.05%, 27.23% and 7.41% market share respectively as shown in Fig 2.6.

The market opportunity has continued to grow year-on-year over the past decade and is projected to continue to grow, though with compressed margins, based on the country's strong demographics and increased broadband penetration.

Private investments in the sector have shifted from the deployment of 2G coverage, which currently stands at 89%, towards 3G and increasingly 4G coverage at 74% and 37% respectively, according to the NCC.

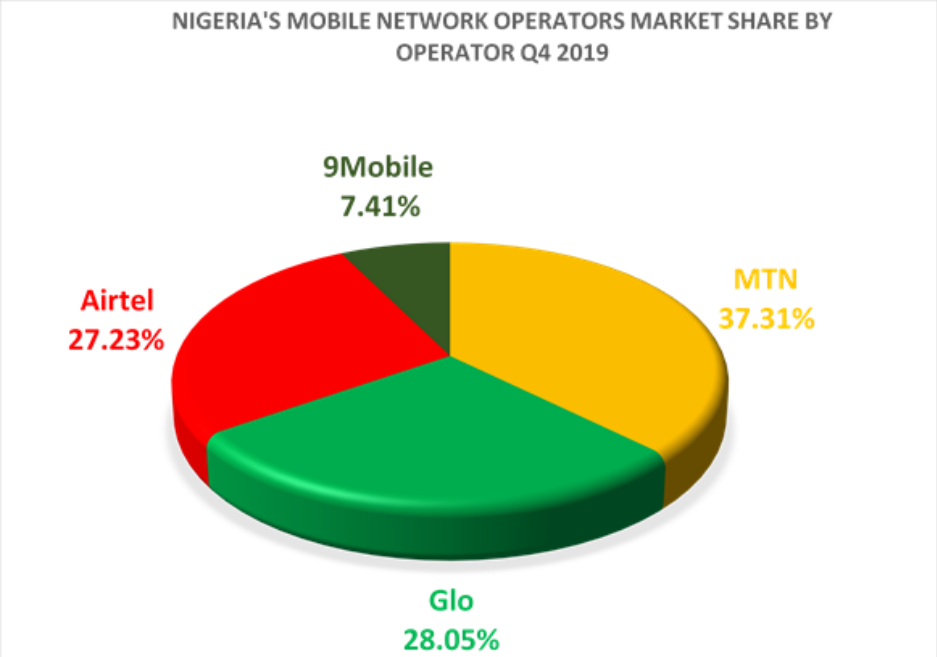


Fig. 2.6: Nigerian MNO Market Share by Operator Q4,2019
Source: NCC

CURRENT BROADBAND PENETRATION

In 2013, Nigeria developed its first National Broadband plan to cover the 5-year period through 2018. At the inception of the plan, internet penetration and broadband services were enjoying a period of fast growth coming off the issuance of 3G licenses in 2007, and the landing of several submarine cables in Nigeria between 2010 and 2013 (MainOne, Glo1 and WACS).

The plan established the objective of achieving a five-fold increase in broadband penetration from the 6% rate in 2012 with download speeds specified at a minimum of 1.5 Mbps. Current broadband penetration rates of 37.8% indicate the objective was achieved as measured in terms of 3G and 4G connections divided by total population. Mobile broadband connections account for approximately 99.8% of the broadband base while fixed connections are at 0.2%.

Effective user rates for broadband penetration are less than the stated 37.8% which is impacted by factors including the large number of subscribers with multiple SIM cards. In terms of actual connected users, GSMA Intelligence data based on a Q4 2019 survey of a representative sample of the population, suggests that Nigeria's unique mobile Internet penetration (3G and above) stands at 32% or 65 Million individual users against a total mobile internet subscription base of 125 Million.

While broadband penetration has increased in Nigeria with the deployment of 3G and 4G coverage, the results achieved in terms of end user adoption has not matched expectations due to a variety of reasons, according to GSMA, including access to and affordability of smartphone devices, quality of service and speed, access to such services beyond major urban areas, access available via public institutions i.e. schools, hospitals and MDAs, limited availability or relevant content and E-government services online, among others. The indicative gap between 3G and 4G coverage rates and adoption based on research by GSMA is shown in Fig 2.7 below.

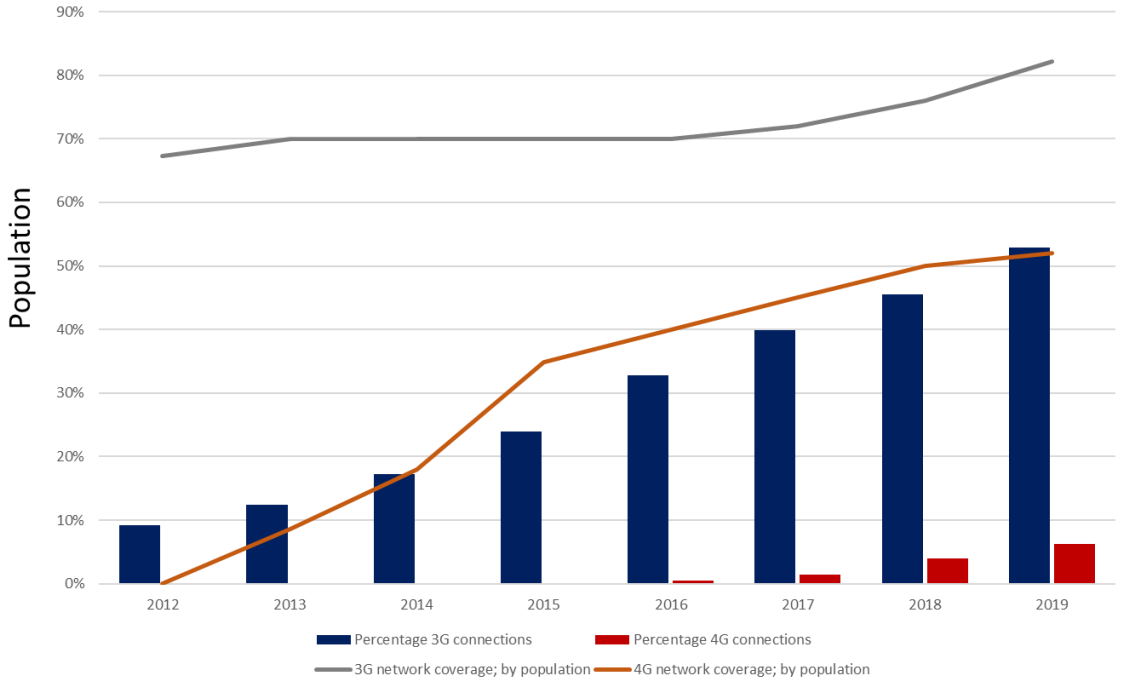


Fig 2.7: Nigeria 3G & 4G Network Coverage vs 3G & 4G Adoption/Subscription chart Source: GSMA 2019

2.1 BROADBAND DEPLOYMENT STATUS

In order to assess the current state of broadband infrastructure capacity in Nigeria today, it is useful to evaluate infrastructure availability against a broadband value chain that categorizes the building blocks for broadband service delivery as the **First Mile**, **Middle Mile** and the **Last Mile** as represented in Fig 2.8 below.

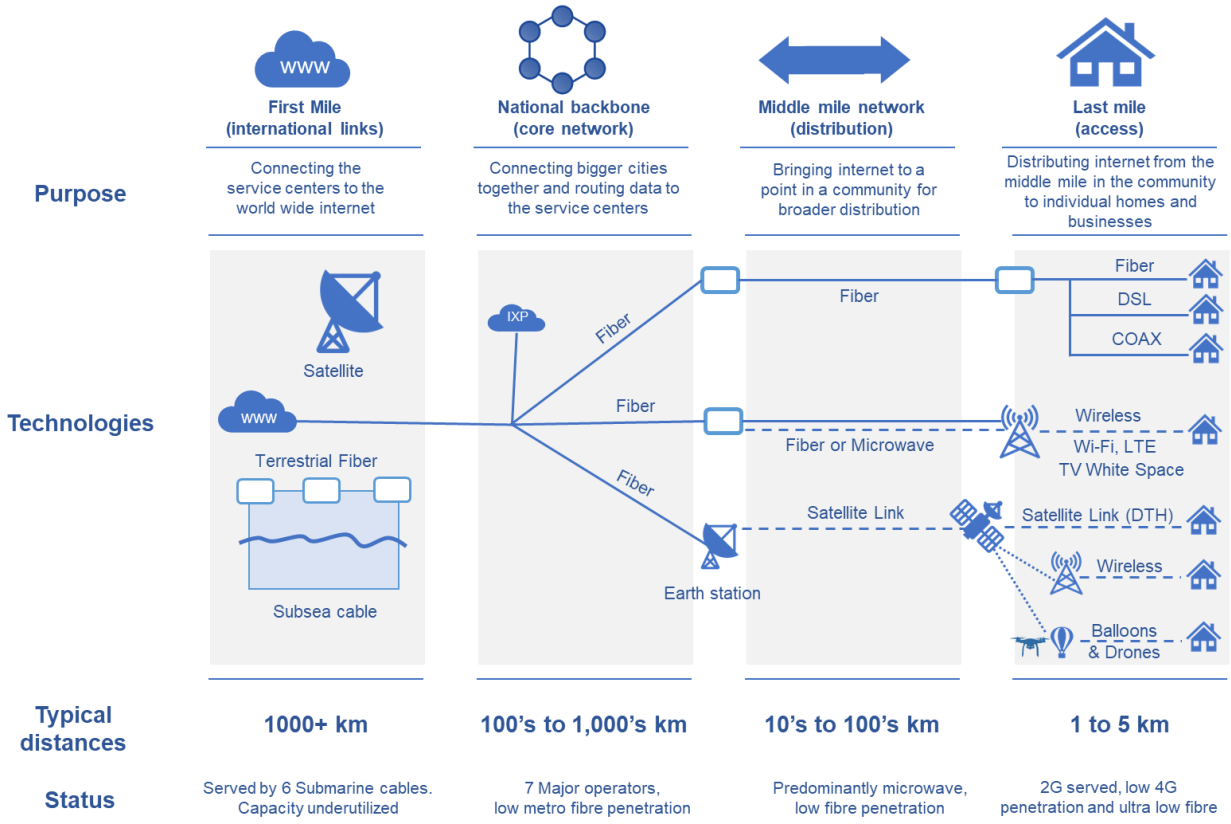


Fig 2.8: Three (3) Tier Broadband Architecture Framework. Source: World Bank/NBP Committee

A. The First Mile:

First mile infrastructure providing international and inter-continental connections to Nigeria are equipped with more than adequate capacity given 6 submarine cables, all landing in Lagos, as well as up to 55 licensed satellite operators delivering services across the country as at January 2020. These services connect Nigeria to neighbouring states where directly accessible, global destinations as well as the internet. This segment has witnessed significant investment and growth in the last decade and the submarine segment is generally acknowledged to have a glut today with over 40Tbps of capacity available on these cables for subscription in Lagos but with less than 10% of that capacity utilized by the total population due to infrastructure limitations across other segments of the value chain. More effective interconnection of these cables will help avert the kind of first mile failures which recently impacted on internet service availability in the country since the existing cables have adequate capacity to provide resiliency in the event

of failure of any single or multiple cables. As shown in Fig 2.9 below, Africa appears reasonably well covered with adequate capacity sufficient to serve the continent well into the next decade.

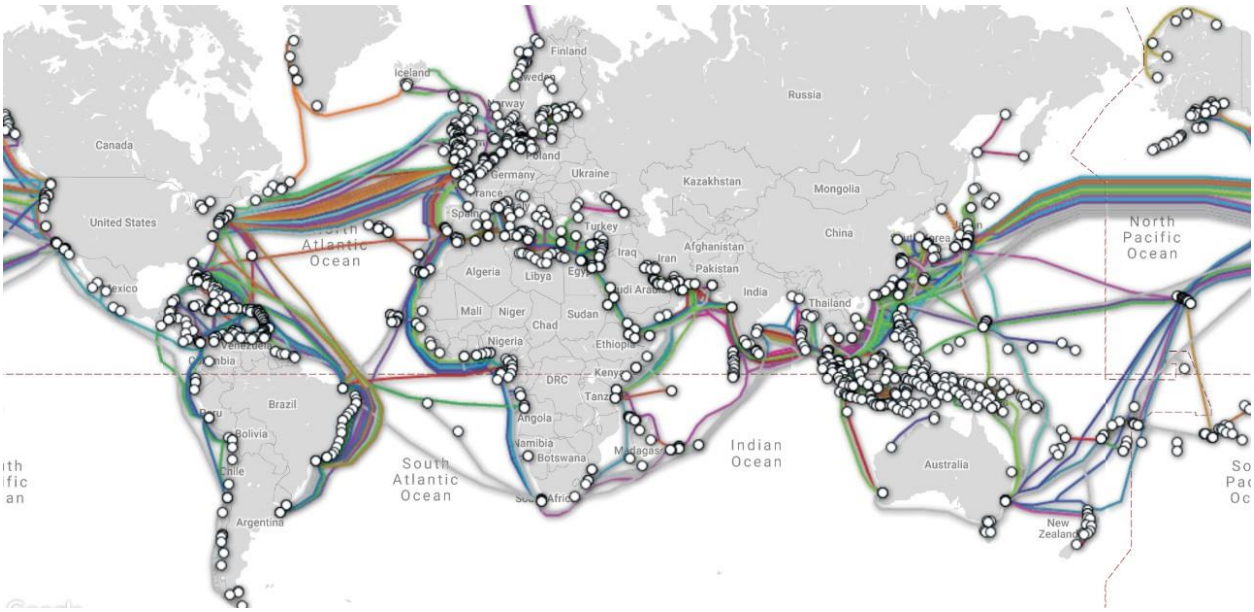
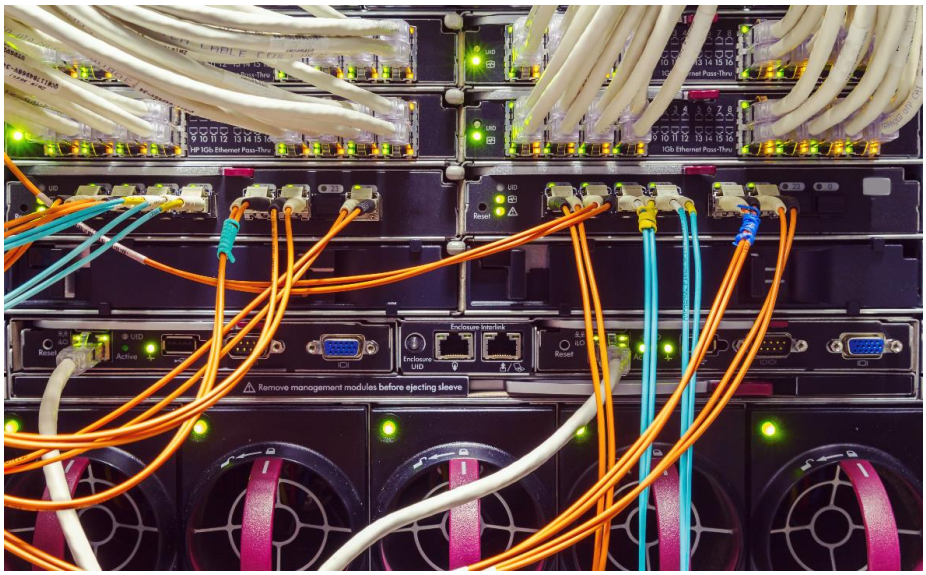


Fig 2.9: World Deep-Sea Backbone connection Source: FCC

B & C. The National Backbone (National Backbone/Core/Distribution Network) and Middle Mile:

The middle mile consists of the National backbone, Core and Distribution Network links, which brings the internet closer to communities in Nigeria for wider distribution, featuring proprietary fibre-optic and microwave networks owned by various operators, including the MNOs, National long distance Operators (NLDOs) and government agencies. Total backbone and middle-mile fibre distance deployed in the country is approximately 54,000 kilometres, largely backhauling traffic between major cities with significant duplication of routes across service providers as shown in the fibre route map Fig. 2.10.



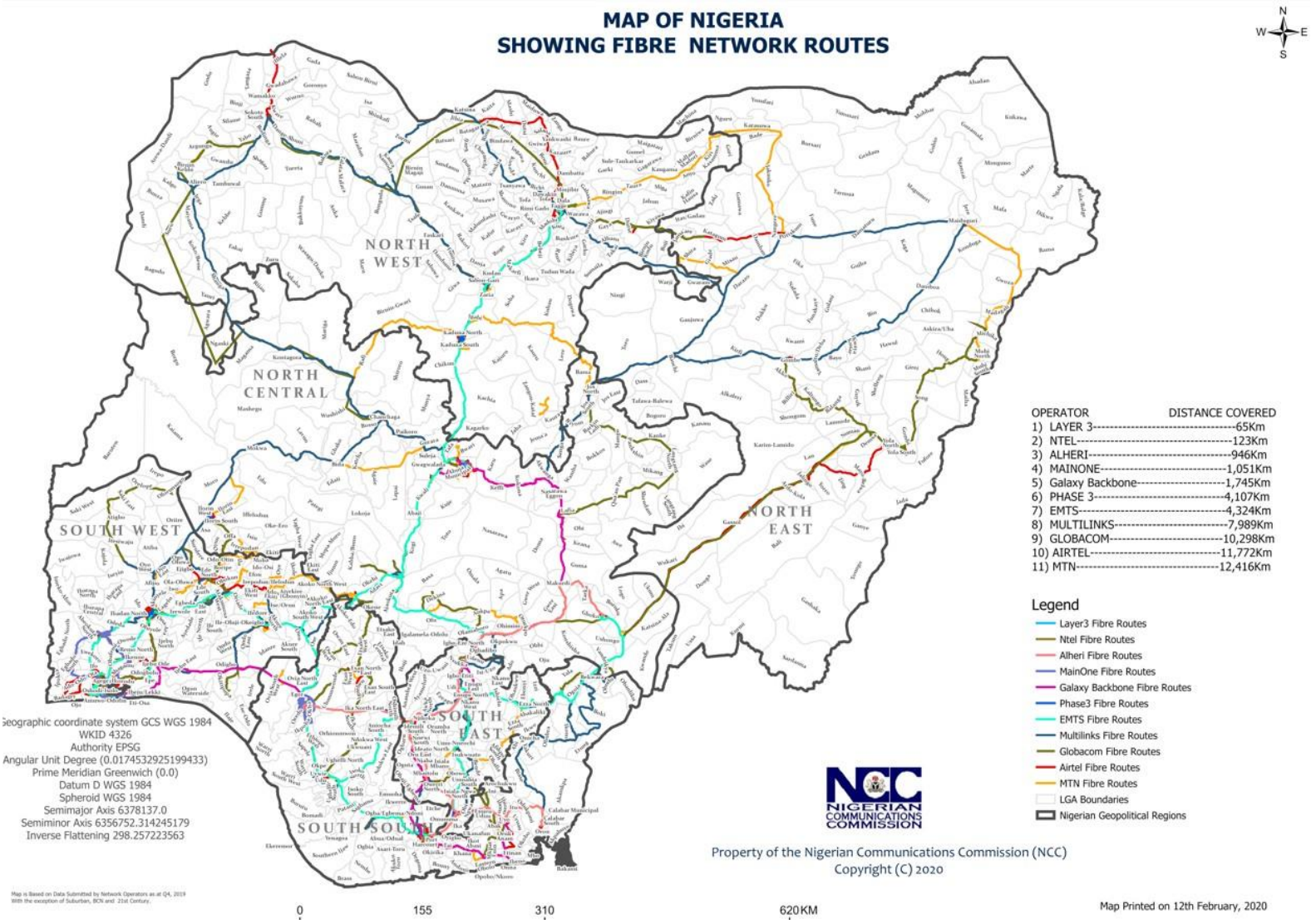


Fig 2.10: Map of Nigeria Fibre Network Routes Q4, 2019 Source: NCC
Map is based on data submitted by Network Operators as at Q4, 2019 with exception of Suburban, BCN and 21st Century

According to NCC, Nigeria's fibre links are mainly owned by the MNOs, as shown above, with other players serving niche areas in terms of coverage, and one major network previously owned by Multilinks not effectively accounted for.

Metro fibre networks currently account for less than 25% of the total fibre distances in the country with concentration in major cities such as Lagos, Abuja, Port Harcourt, and within Edo and Ogun states, while other areas remain unserved or underserved.

Access of fibre networks within 5 kilometres of the population currently stands at an average of approximately 39% reach, with a high of 85% in Lagos State and a low of 12% in Jigawa State as shown in Fig 2.11 below. Last mile FTTx connection rate is low and Fibre to the Tower connection rates are also low in comparison to other African countries.

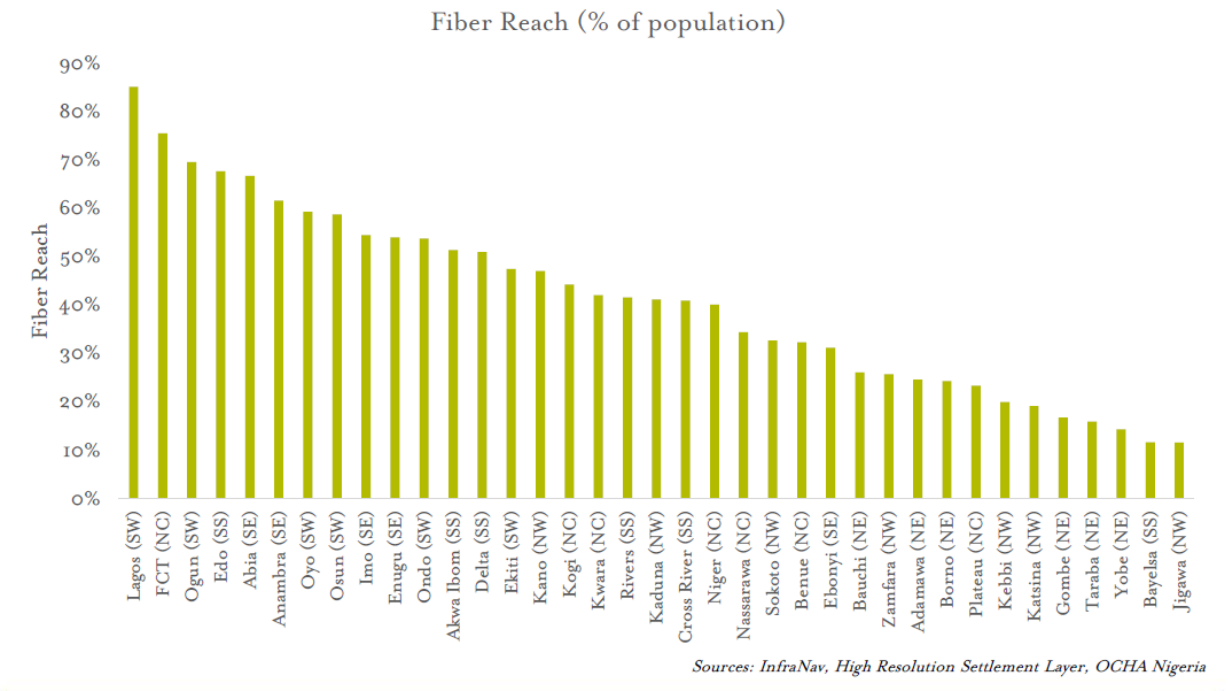


Fig 2.11: Chart of % of Population within 5Km of Fibre Reach in each Nigerian State Source: HIP Consult

A large volume of traffic within the middle mile networks is still backhauled using microwave equipment today. While this type of backhaul was adequate for narrow-band voice communications, it is no longer adequate for the effective delivery of video and bandwidth-intensive broadband applications driving current demand. The need to make fibre-optics the de-facto means of backhauling traffic within middle-mile networks cannot be overemphasized, for the effective deployment of broadband networks.

D. The Last Mile:

Last mile connectivity in Nigeria is largely mobile with comparatively lower investments made in fixed lines infrastructure within the past two decades.

Mobile coverage across Nigeria grew upon the issuance of DML licenses to operators that initially deployed 2G technology to provide voice services and effectively covering greater than 89% of Nigeria's population today. Demand for internet access and availability of spectrum has stimulated the growth in 3G services which covers about 75% of the population.

4G deployments have been limited to deployments in the major urban areas within the past 3 years and are currently available to approximately 37% of Nigeria's population.

The maps below, (Fig 2.12-2.14), show the network coverage and indicate that even with 3G coverage most areas of the country are only being served by one of the operators while 4G remains sparse beyond the very largest urban areas and state capitals.

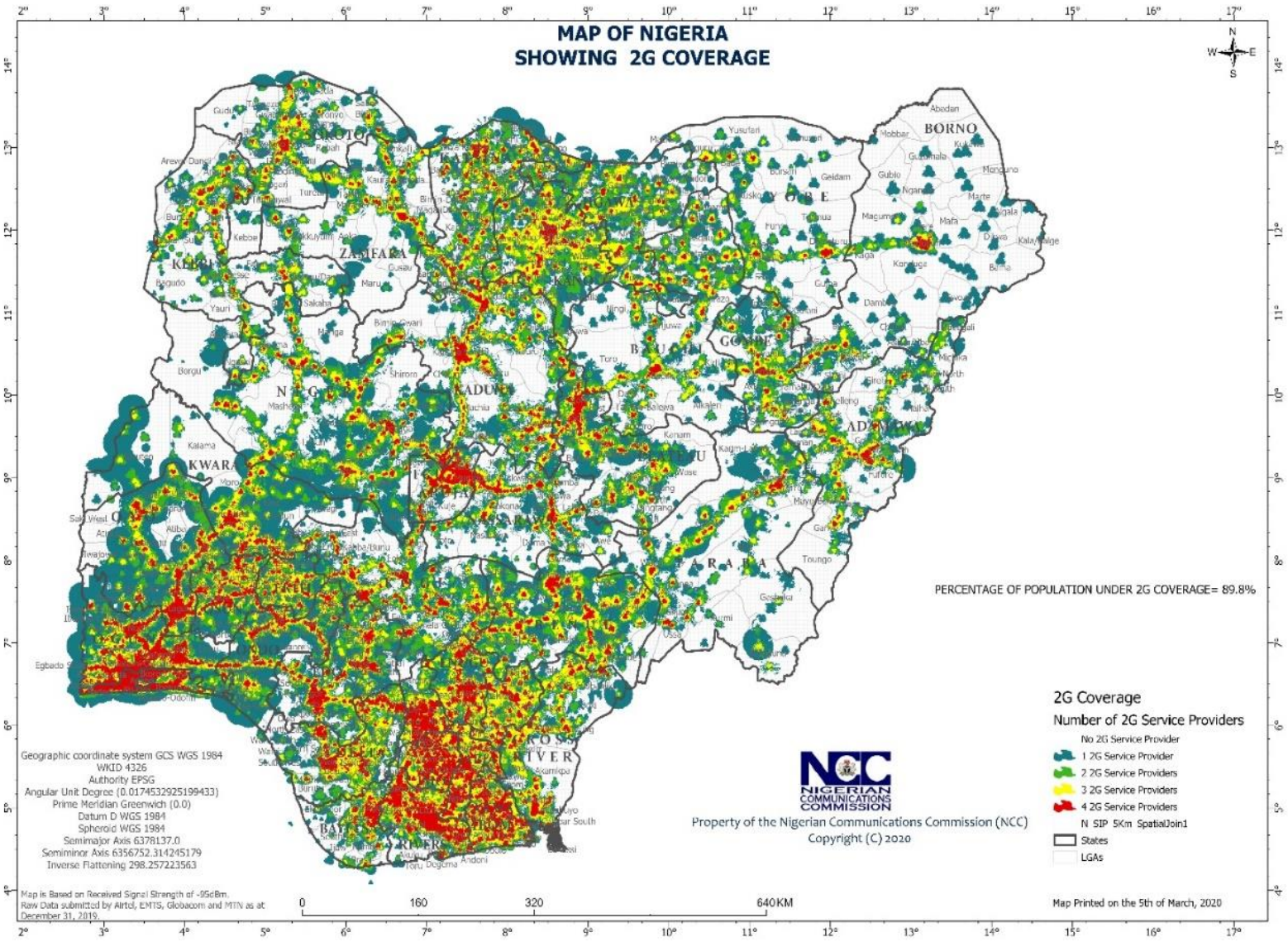


Fig 2.12: Nigeria's 2G coverage map as at Q4 2019 Source: NCC[1]

[1] Coverage means received signal strength of (-95dBm) at cell edge. Spot verification exercises are carried out to validate signal strength

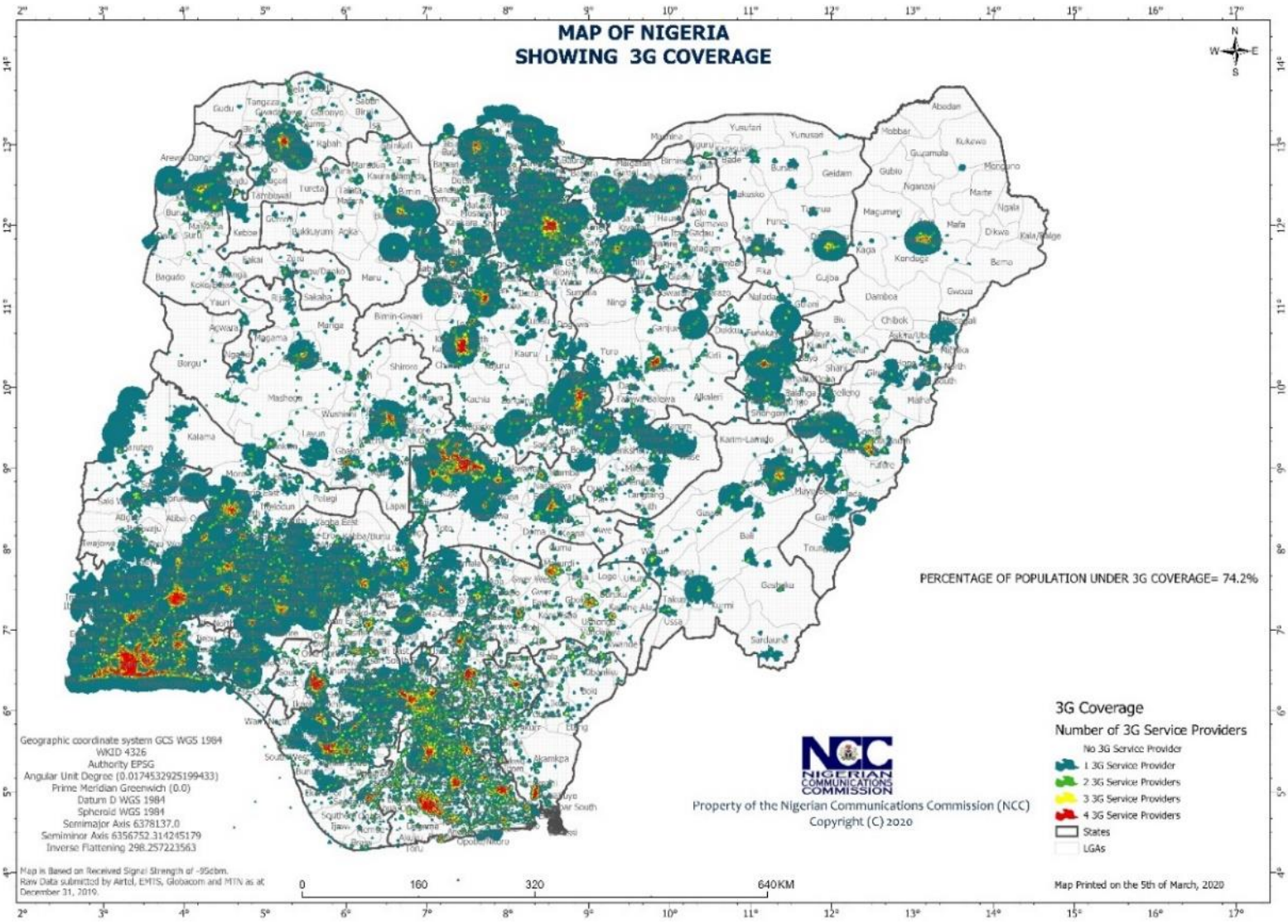


Fig 2.13: Nigeria's 3G coverage map as at Q4 2019 Source: NCC

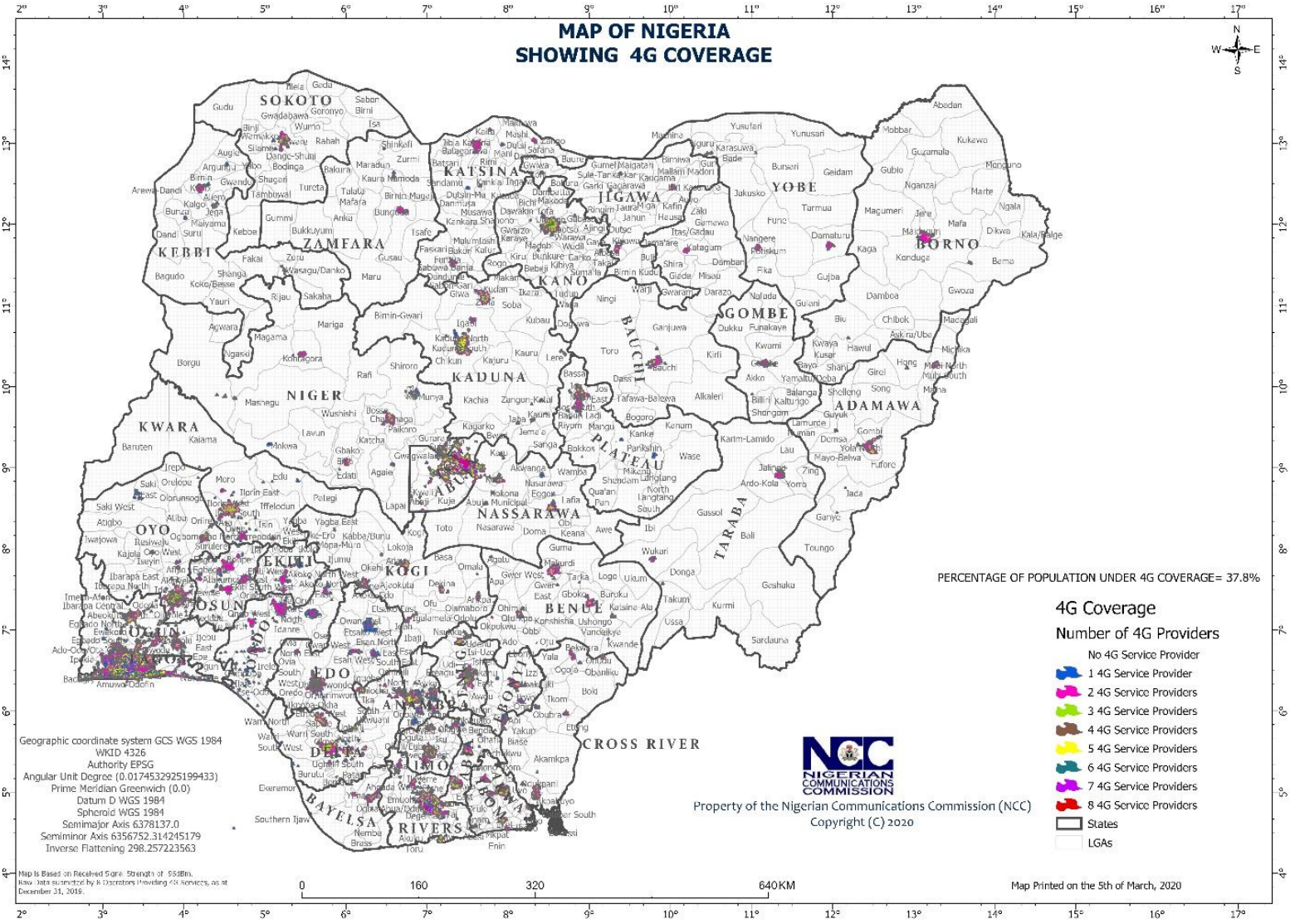


Fig 2.14: Nigeria's 4G coverage map as at Q4 2019 Source: NCC

Limited coverage has impacted major government programs such as the National Identity Data Capturing exercise whereby the absence of 3G and 4G services have limited data capture in some areas of the country as depicted in the map Fig 2.15 below. In addition, absence of coverage has provided a cover for criminal activities and insecurity within unserved areas.

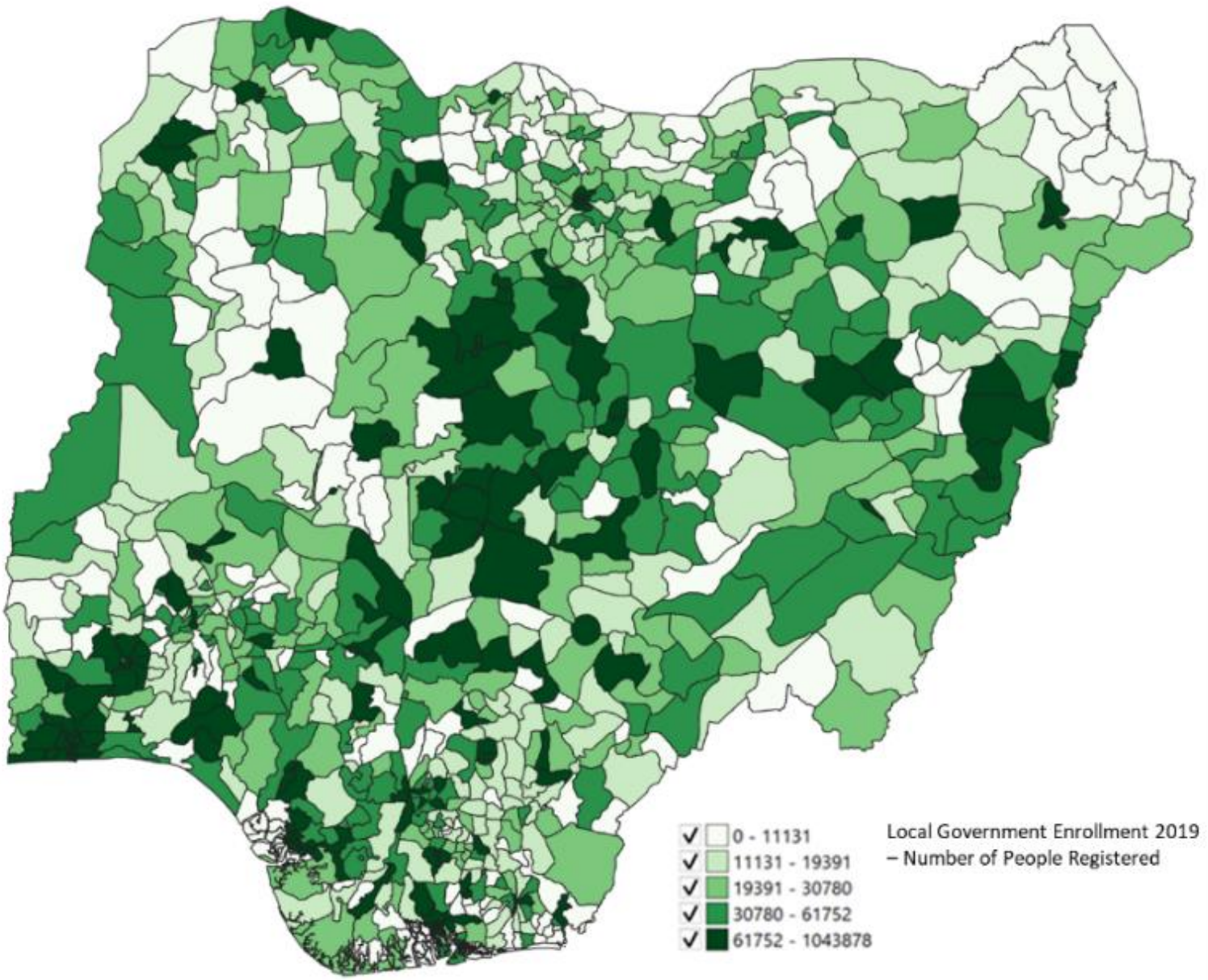


Fig 2.15: Local Government's National ID Enrolment at a Glance 2019 Source: NIMC

Further to the coverage maps, there is the need for improvement in last mile connectivity to end user and increased adoption. Nigeria's unique mobile Internet penetration which stands at 32% or 65 Million individual users against a total mobile internet subscription base of 125 Million, lags behind Ghana, Egypt and South Africa within the region as shown in the charts Fig 2.16 , Fig 2.17 below.

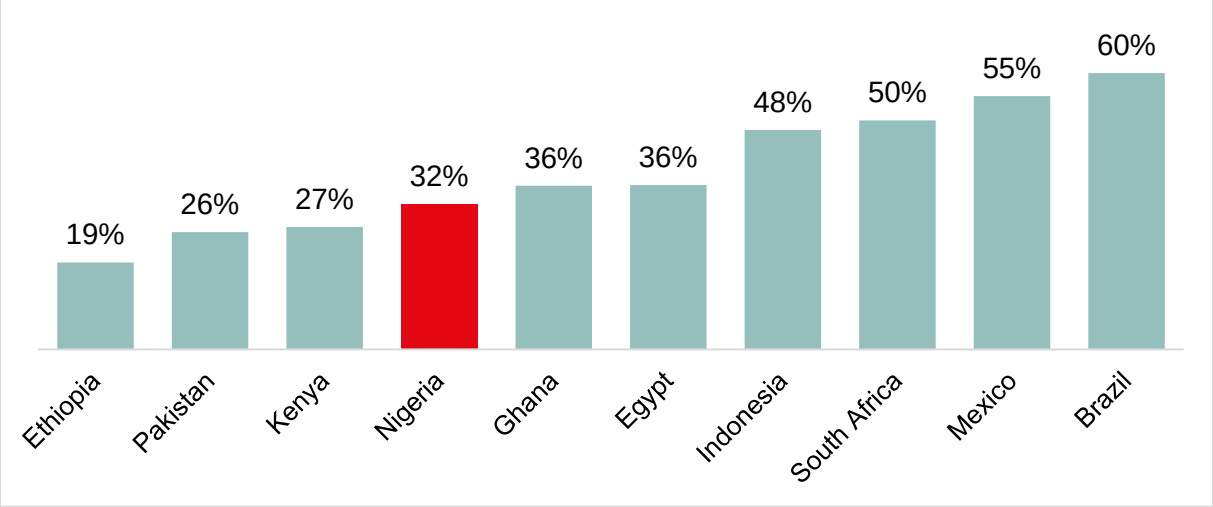


Fig 2.16: Nigeria's unique mobile internet penetration versus selected countries, 2019 Source: GSMA Intelligence

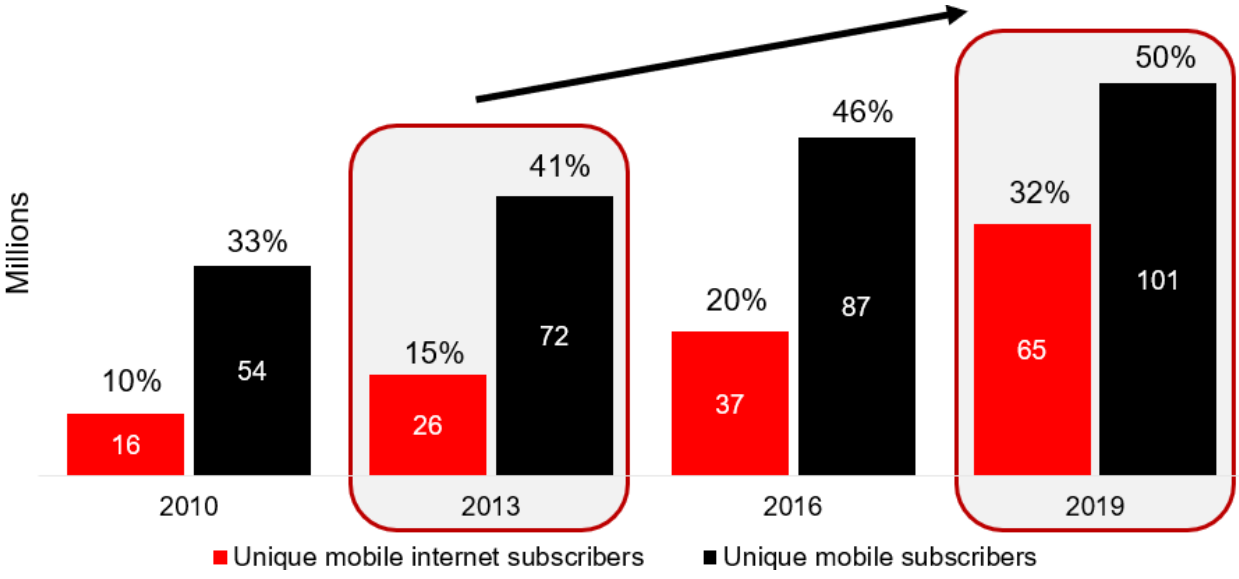


Fig 2.17: Nigeria's percentage of mobile internet penetration SOURCE: GSMA Intelligence

Broadband Services Affordability

Broadband affordability in Nigeria has significantly improved with aggressive competition for increasing internet services revenue among the major operators. These developments have resulted in the achievement, in 2019, of pricing at approximately N1,000 ($2.78) for 1GB of data or 1.78% of average GDP/Capita in line with the global benchmark for affordability set by the Alliance for Affordable Internet (A4AI) and the UN Broadband Commission "1 for 2" target for the availability of 1GB of data at no more than 2% of average monthly income.

The challenge with this affordability benchmark in Nigeria's context is, given high income disparities, the median monthly income of N19,460 ($54) is much lower than average income levels of N60,000 ($167) per month. Thus, internet bundles at these price points remain largely unaffordable for the majority of Nigerians.

As a result, services will need to become less expensive for the 100 Million Nigerians living below the median to afford broadband services.

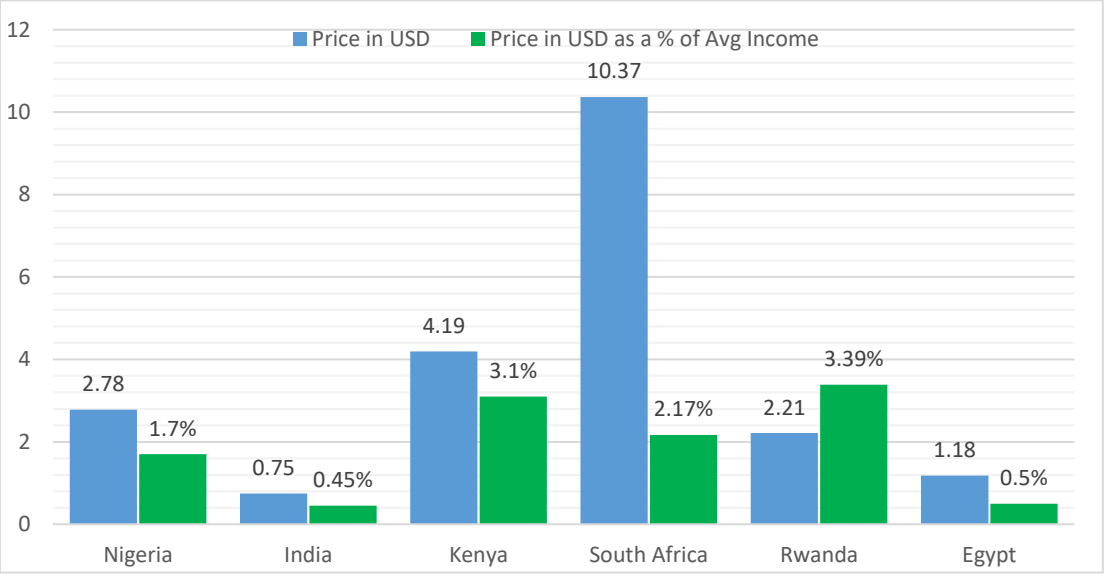


Fig 2.18: Nigeria's Broadband Affordability A4AI Report 2019 Source: A4AI

Fig 2.18 above shows Nigeria's affordability relative to countries in a similar income group. Nigeria ranks 28th (out of 99 countries surveyed) on the 2019 Affordability Drivers Index (ADI), a composite measure of the drivers of internet affordability focused on infrastructure and access, though services remain unaffordable for majority of the population living at relatively low-income levels. According to A4AI, of the countries among A4AI's pricing data, covering the most affordable internet (as % of income) the top 6 countries are Sri Lanka, Kazakhstan, Malaysia, India, Turkey and Egypt, with two of the countries appearing in the chart above.

2.2 REVIEW OF UNSERVED AREAS AND ACCESS GAPS

Broadband coverage to unserved areas is critical to ensure delivery of quality internet services and to provide access to enhanced economic and social opportunities such as financial inclusion, and access to government services including security agencies for every Nigerian. Key access gaps have been addressed through intervention programs implemented to ensure the unserved (no operator present) and underserved (areas with only one operator) receive the benefits of broadband connectivity, but there is more to be achieved.

In 2013, 207 clusters were unserved per USPF; by Q4, 2019 this number had been reduced to 114 and was achieved via USPF support in providing funding for connectivity to 93 unserved clusters over 6 years. Fig 2.19 below shows the 2019 status of areas with coverage in white and those still unserved in shades of brown. The list of 114 still unserved clusters can be found in Appendix 7.2.1

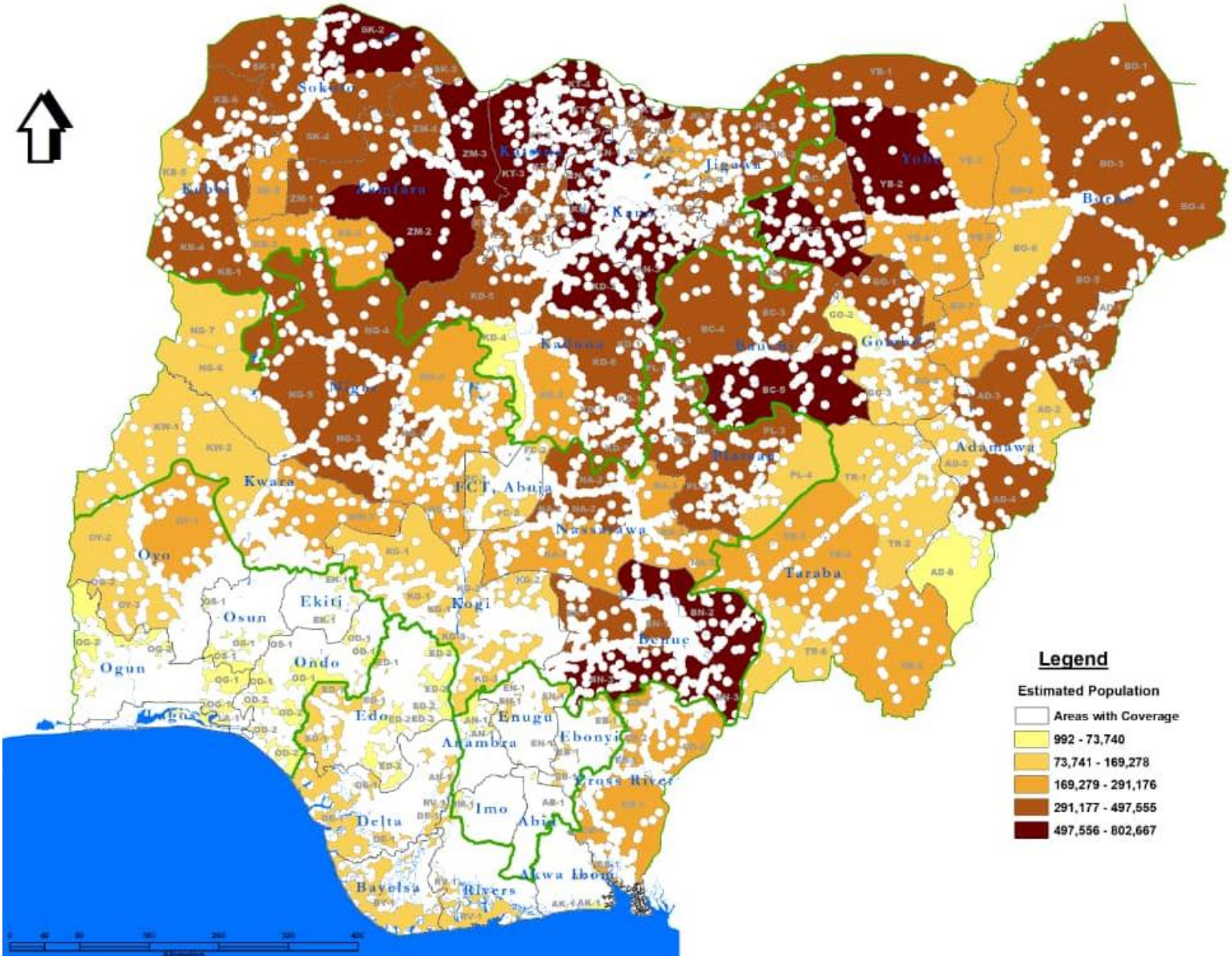


Figure 2.19: USPF Unserved Population Cluster Map Q4 2019.
Unserved population clusters based on average of 5km radius baseline from the nearest base station validated by drive test

3 CURRENT STATUS

3.1 REVIEW OF 2013 – 2018 PLAN

Plan Objective

The 2013 – 2018 Nigerian Broadband Plan laid out a strategy to provide broadband access across the country by establishing enabling policies and enacting necessary regulatory and developmental measures. The plan also sought to address barriers to expanding services to unserved areas across the nation over its 5 year span.

Implementation and Adoption

The roadmap for the implementation of the 2013-2018 plan highlighted nine (9) key categories to be delivered over the 5-year period by specific agencies of government and licensees. A Broadband Council was established under the then Ministry of Communication Technology (now Ministry of Communications and Digital Economy), to monitor, evaluate and fine tune implementation of the plan where necessary. While certain elements of the plan were implemented and the overall target set for penetration was achieved, adoption of the plan was limited. The status of the Plan's key activities at the end of the 5-year period is summarised below.

Table 3.1 Current status of implementation: 2013-2018 NNBP

ITEM	DESCRIPTION	RESPONSIBILITY	TIMELINE	STATUS/COMMENTS
Policy and Regulation	Define the open access framework and secure RoW Waivers with states	FMCT, NCC	2013	Infraco policy rolled out but unsuccessful as incumbent operators were not involved.
	Enable expedited RoW permits for the rapid rollout of base stations	FMCT, State Govts, FMoW		States did not grant RoW
	Declare Critical National Infrastructure	National Assembly, State Govts		Cybercrime Act 2015 passed. HM FMoCDE working on implementation and enforcement of current laws
	License new operators as required	NCC		Required to achieve plan objectives

ITEM	DESCRIPTION	RESPONSIBILITY	TIMELINE	STATUS/COMMENTS
Enabling Infrastructure	Interconnect National and Regional Long-Distance Operators	FMCT, NCC, FMoP Licensees	2013	Interconnection is not an issue. Open access has not happened as anticipated
	Incentivise rollout of fibre infrastructure	FGN, NCC, State Govts	2013-2014	Not much fibre growth achieved. Fibre is being over built in already served areas
	Agree 3G Rollout Target implementation with operators	NCC, Licensees	2013	No specific target set
	Publish plan for freeing up more Spectrum for LTE rollout	NFMC, NCC, NBC	2013	No plan published
	Conduct spectrum licensing for LTE in 2.5GHz, and 2.6GHz bands	NCC	2014-2015	Some spectrum released
	Release spectrum on the sub-40GHz bands for mobile backhaul	NCC, NFMC	2014-2015	Deferred due to ITU consideration Not released to industry.
	Agree Financial Incentives for achieving rollout targets	FMCT, NCC, MoFI, Licensees		USPF subsidies provided for 86 BTS
	Agree Funding Options for accelerating broadband Infrastructure rollout	FMCT, NCC, USPF, MoFI		Infraco incentives defined but not yet implemented. USPF incentive structures for rural coverage not attractive because of focus on CAPEX and not OPEX
Costing & Pricing	Agree cost-based lease pricing model and implement agreed wholesale price caps	NCC, Licensees	2013	Department of Policy, Competition and Economic Analysis of the NCC is working on a wholesale pricing study for completion in 2020

ITEM	DESCRIPTION	RESPONSIBILITY	TIMELINE	STATUS/COMMENTS
	Agree Plan to review the cost of acquiring spectrum licenses	NFMC, NCC		No specific action taken was identified. Action pending with NCC.
Funding & Investment	Agree Financial Incentives for achieving rollout targets		2013	USPF subsidies provided for 86 BTS
	Agree Funding Options for accelerating broadband Infrastructure rollout	FMCT, NCC, USPF, MOFI		Infraco incentives defined but not yet implemented. USPF incentive structures for rural coverage not attractive because of focus on CAPEX and not OPEX
Driving Demand	Set up Public Access Points and ICT Training Centres	NITDA, USPF, DBI, State Govts	2014	Various initiatives undertaken but sustainability has been an issue
	Educate women on the use and benefits of ICT	FMCT, NCC, USPF		Affordability is an issue
	Interconnect all Internet Exchange Points	NITDA, NCC		Completed but upgrade required
	Connect all universities	GBB, NUC, FMCT,USPF		In Progress but not sustained due to Op-Ex challenges in funding sustained bandwidth and power.
	Connect schools, colleges and hospitals	State Govts, NCC, USPF		Limited progress and no formal program defined. No structures to manage or drive towards targets
	Incentivise OEM sub $30 smart phone devices	NCC, Local Manufacturers		No specific action taken
Building Fibre Infrastructure	Build Metro fibre networks in all the major cities and state capitals	Licensees, State Govts	2014	Overlapping fibre being built by operators on the same route. All but one State capital has at least one fibre connection
	Incentivise building of last mile wire line infrastructure to homes,	NCC, Licensees		No specific structures put in place to drive standards

ITEM	DESCRIPTION	RESPONSIBILITY	TIMELINE	STATUS/COMMENTS
	estates, and commercial premises			
	Extend international cable landing points to other coastal states	FMCT, NCC, Licensees		No specific action taken
Wireless Broadband Infrastructure Upgrade and Expansion Phase 1	All new cell sites to be LTE compatible	Licensees	2014	No specific action
	Spread 3G to at least 50% of the population	NCC, Licensees	2015	This has been achieved
	Complete Digital Dividend spectrum migration	Licensees, NBC, NCC		Partial assignments achieved; spectrum to be fully cleared in certain cities
	Release more spectrum for LTE	NFMC, NCC		Some spectrum released but more required by major operators
Wireless Broadband Infrastructure Upgrade & Expansion Phase 2	Spread 3G/LTE to at least 70% of the population	Licensees, NCC	2017	74.2% of 3G was achieved as at September 2019
Wireless Broadband Infrastructure Upgrade & Expansion Phase 3	Spread 3G/LTE to at least 80% of the population	Licensees, NCC	2018	This is yet to be achieved

3.2 GLOBAL BENCHMARKS

In determining the targets for the next phase of Nigeria's broadband journey, a global benchmarking of national broadband plans and targets was conducted with cognizance of country size and economic indices in context of the goals set for speed, coverage, penetration and affordability of broadband.

As indicated in previous sections, Nigeria is currently lagging other countries with similar income levels i.e. Egypt, India and Ghana in terms of Internet penetration rates, and also lags behind these countries and Kenya in terms of the relative proportion of mobile broadband connections. In particular 4G coverage is only available in major cities and state capitals with less than 40% coverage of the population as at Q4, 2019 (NCC).

In addition, current download speeds for Nigeria rank behind other countries in Africa with recent average mobile download speeds of 2.7Mbps as measured by Measurement-Lab (M-Lab) versus Kenya at 5 Mbps and South Africa at 4.1 Mbps respectively as shown in Fig 3.2 below.

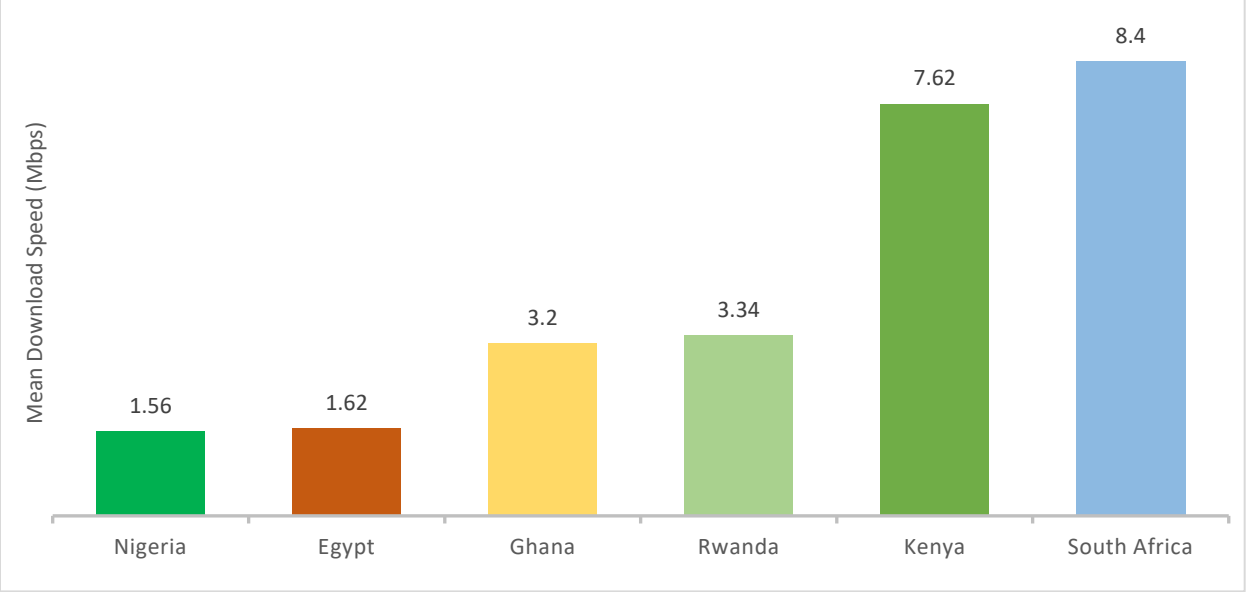


Figure 3.2: Mean Internet Download Speed 2019 Source: M-Lab

In benchmarking the digital economy, the Network Readiness Index (NRI), maps the network-based readiness landscape of 121 economies based on their performances across 4 Pillars and 62 indicators (Fig 3.22). The index measures the propensity for countries to exploit the opportunities offered by information and communications technology (ICT) and is published in collaboration with INSEAD, as part of their annual Global Information Technology Report (GITR).

The report is regarded as a comprehensive assessment of how ICT impacts the competitiveness and well-being of nations and the results provide an indication of the gap that Nigeria needs to close in order to attain a competitive digital economy. Sweden, Singapore and the Netherlands are ranked 1, 2 and 3 with scores of 82.65, 82.13 and 81.78 respectively. In the African region Mauritius leads with a score of 53 (Rank 53), South Africa scored 47 (Rank 72), Egypt scored 39 (Rank 92), while Nigeria scored 28 and (Ranked 111) as shown in Fig 3.21 below.

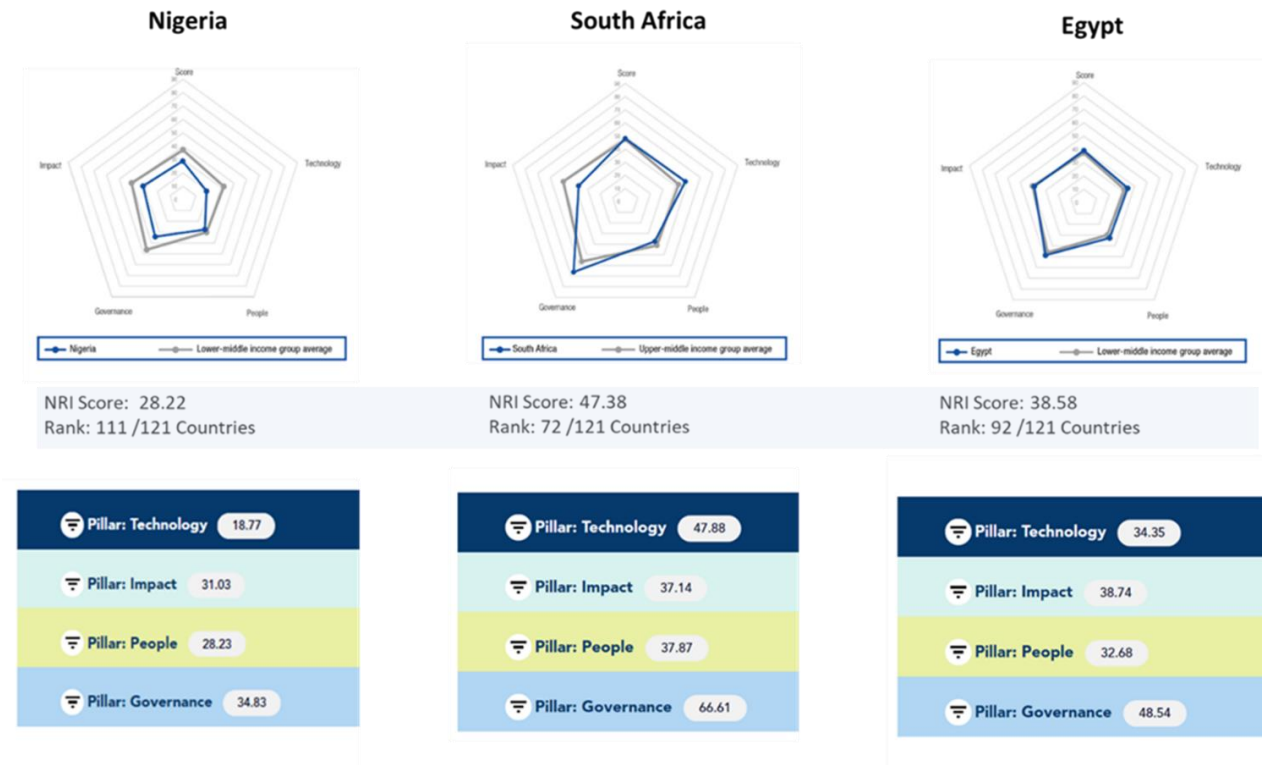


Figure 3.21: Network Readiness Index Country Comparison 2019 Source: NRI

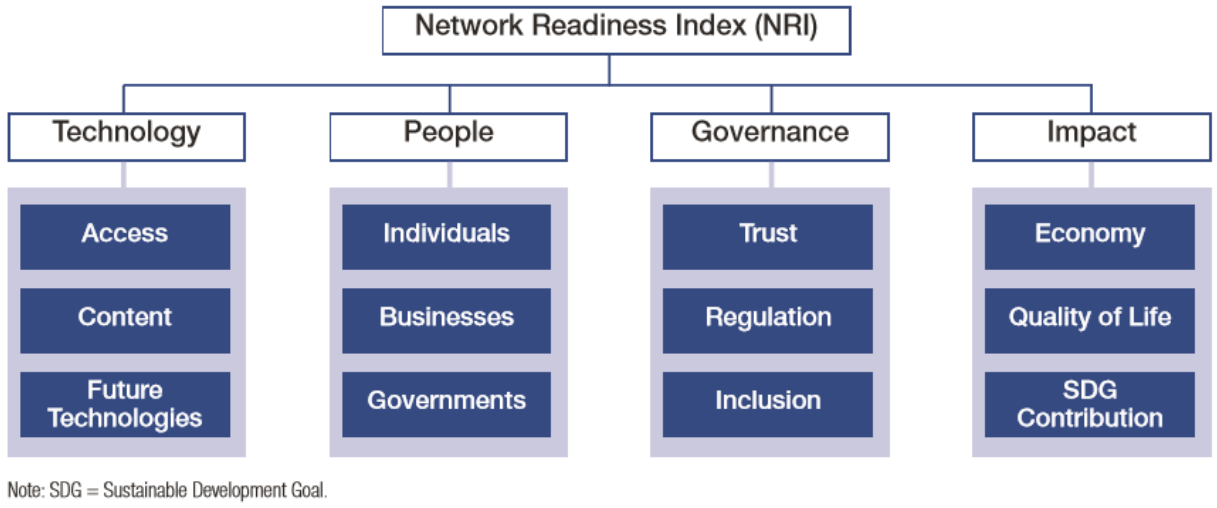


*Figure 3.22: Network Readiness Index Model 2019 Source: NRI (*Networkreadinessindex.org)

The definition of broadband is also influenced by considerations of the particular technology utilized to deliver services. With over 99% of telecommunication services in Nigeria being delivered via mobile wireless networks, the definition of broadband speeds in the previous and current plan continue to be constrained by limitations in the wide scale deployment of 4G and 5G broadband technologies.

In addition to addressing the requirements for pervasive broadband across Nigeria, this plan makes provision for future deployment of fixed technologies, which are currently available solely in high net worth urban areas. Fixed infrastructure will also be required to support the 4th Industrial Revolution applications including Smart City, IoT, Artificial Intelligence, Autonomous vehicles and other advanced technologies.

Based on the services available online and usage patterns today, the broadband definition of 1.5 Mbps in the previous plan is viewed as inadequate to meet the requirements now and going forward into 2025.

This plan defines broadband as the availability of download speeds at a minimum of 10Mbps in rural areas and a minimum of 25Mbps in urban areas by the end of the plan period in 2025. This plan targets the full deployment of 4G LTE networks since the already existing 2G and 3G services are unable to achieve these kinds of download speeds with large populations.

Another particular area of focus is the need for denser fibre-ization, to aggregate fibre from base stations and across metro areas, backhaul traffic across the country and interconnects with content in data centres. To date, fibre density in Nigeria remains particularly low with approximately 10% of base stations connected to fibre and majority of the fibre networks over-built on the same routes. The continued reliance on narrowband microwave links remain a limiting factor in terms of aggregate capacity and stability of mobile networks especially in a challenging electricity supply environment. Denser metro fibre networks will also provide the essential building blocks for future Fibre-To-The-X networks.

Table 3.2 below shows the targets set for achievement between 2018 and 2020 by various broadband plans in peer countries and indicate targets for the leading global economies of US and China as aspirational targets for the 2020 - 2025 Nigerian Broadband plan.

Table 3.2 Deloitte Analysis of National Broadband Plans and Country Indices (2018 – 2020)

Metrics	Nigeria	Egypt	S. Africa	Kenya	India	China	US
Internet Speed	1.5Mbps (2018)	25 Mbps	5 /10/100Mbps	2 Mbps	100 Mbps (2020)	Urban 50 Mbps Rural 12 Mbps	100 Mbps (2020)
Coverage	80% 3G mobile 30% Fixed	Mobile: 3G for 90% of pop. Fixed: 90 % of HH	User:90% 5Mbps 50% at 100 Mbps	3G to 94% of the population	100% of 250k local govts.	98% coverage target	100 Mill households (>80%)
States Local Govts	All states & cities by 2014 Universities, schools, Public Access Points	100 % of govt./ service entities 100% 3rd level locality >1 Public A.P. (25 Mbps)	100% at 10Mbps 80% at 100Mbps (2020)	> 2 base stations for 1,450 wards. 100% connectivity (2023) 100% mfcg. firms using BB	Connect 250,000 (100%) local govts by 2020	98% of administrative villages	1 Gbps schools, hospitals, govt.
Land mass	923,763 sq. km (0.9 Mill)	995,450 sq. km. (1 Mill)	1,221,037 sq. km. (1.2 Mill)	580,367 sq. km. (0.6 Mill)	3,287,263 sq. km (3.2 Mill)	9,388,210 sq.km. (9.4 Mill)	9,147,420 sq. km. (9.1 Mill)
Population / Population Density	195,874,740 **(195 Mill)** 215 ppl./sq. km	98,423,595 **(98Mill)** 99 ppl./ sq. Km	57,779,622 **(57Mill)** 48 ppl./ sq. km	51,393,010 **(51Mill)** 90 ppl./ sq. km	1,352,617,328 (1.35 Bill) 455 ppl./sq. km.	1,392,730,000 (1.39 Bill) 148 ppl./sq. km	327,167,434 (327 Mill) 35 ppl./ sq. Km
Penetration	30% broadband penetration	Fixed: 9 Mill (10 %) of population Mobile: 14 Mill subs (~15 %) pop.	80- 100% Schools, Health, Public sector targets	94% population 3G	600 Mill. BB connections	Fixed Bb: 70% Mobile Bb: 85%	>80% population
Affordability (2019) A4AI	$2.78/1GB (1.70% avg. inc.)	$1.18 /1GB (0.50% avg. inc.)	$10.37/1GB (2.17% avg inc.)	$4.19/ 1GB (3.10% avg. income)	$ 0.75 / 1GB (0.45% avg. inc.)	$5.57/1GB (2019) (0.71% avg inc.)	N.A.
Median Monthly Income/Capita	**$54.10** (2010) N19,460	$146.67 (2015)	$134.41 (2015)	$73.24 (2015)	$77.6(rural) 2012 $107.46 (urban)	$184 (rural) 2015 $335.26 (urban)	$1598.13 (2016)
GDP/Capita	**USD 2,028**	USD 2,549	USD 6,374	USD 1,711	USD 2,010	USD 9,771	USD 62,794
Economic growth Annual GDP % 2018	1.94%	5.31%	0.78%	**6.32%**	**6.81%**	**6.57%**	2.93%
Network Readiness Index: 121 nations	Score **28/100** 111/121 nations	Score 39/100 92 of 121	Score 47/100 72 of 121	Score 38/100 93 of 121	Score 45/100 79 of 121	Score 58/100 41 of 121	Score 80/100 8 of 121

Data Sources: World Bank, A4AI, NRI

4 TARGETS & TIMELINES FOR 2020 - 2025

The 2020 – 2025 NNBP Committee charted a pragmatic and feasible path forward for the country with measurable, achievable targets for broadband speed, coverage, penetration and affordability as key indices.

Broadband Definition: The 2020 – 2025 plan defines broadband as connectivity delivering a minimum of 10 Mbps in rural areas and a minimum of 25 Mbps in urban areas to every Nigerian at an affordable price and quality by 2025. Further definitions of key areas in Table 4.1 below can be found in Appendix 7.0.

Table 4.1 2020 -2025 Nigerian National Broadband Targets

No.	Key Area	Details	Indices	Targets (2025)
1	**Coverage of Population**	Individuals	4G[1]	4G/5G mobile at 90% population coverage
2	**Speed**	Urban	Minimum Download speed[2,3]	10Mbps by 2023 25 Mbps by 2025
		Rural	Minimum Download speed	5Mbps by 2023 10 Mbps by 2025
3	**Penetration**	Number of connected individuals	Youth > 15yrs and Adults	70% of eligible individuals
4	**Fibre Reach**	Schools	Ensure Fibre build such that institutions are within 5km of fibre manhole or with a fixed connection	100% Tertiary Institutions[4] 50% Secondary Schools 25% Primary Schools
		Health Facilities		Connecting 1 General or Major Hospital per LGA and Federal Medical centres
		Local Govts.	Build in state capitals and major cities	90% of (774) Local Govts. HQ (secretariat) connected by Fibre. 10% by Satellite / Fixed /Other in hard to reach areas.
		Fibre to Towers	% Towers Connected	60% of Towers Connected
		Fibre Infrastructure	Open access shared Fibre	Minimum 120,000km needed. Non overlapping routes. All major roads, Federal + State. Minimum: 90% of LGAs
5	**Affordability:** **Data**	1GB for Data over 1 Month "1 for 2"	2% of median income/Capita i.e. 2% of (N19,460/month) @ N360/$1	N390 / 1GB

No.	Key Area	Details	Indices	Targets (2025)
	Cost of Devices	Facilitate access to low cost broadband devices	Incentivize local manufacture of devices	At least 1 locally assembled Smart Device by 2023 Target Price[5]: <$ 50 (N18,000) by 2023; <$25 (N9,000) by 2025
6	**Digital Literacy and Skills**	Number of Youth & Adults (> 15yrs - World Bank) with basic digital literacy	ICT Degrees, Programs, Digital Education in Basic Education System.	Target: 60% Digital Literacy in Nigeria by 2025[6]
7	**Gender Equality**	Access to end user devices and data	% female mobile internet users compared to men	100% of Women in National Social Investment Programs have Digital Access. Target up to 5 Million women (Closer gender gap from 15% to 10% mobile internet users. A4AI)[7]
8	**Unserved Rural Communities**	Communities with no connectivity	Number of unconnected communities [8]	100% of unserved clusters to be covered (2025). This represents the last 10% not covered by 3G/4G targets. Use alternate technologies. e.g. satellite.

Foot notes:

1. 4G coverage as a minimum by at least 2 operators
2. The country still aspires to higher speeds in urban areas where 5G services may be deployed at its own pace.
3. Speed measurements to be done using publicly available crowd sourcing platforms and drive tests.
4. Educational institution connection to fibre should be tracked and measured as component of closing Fibre reach gap.
5. Already GSMA is working with major operators, OEMs and stakeholders in Africa and Asia on an RFI with a target of producing a smartphone (3G&4G) for less than $20.
6. UN Digital Literacy Target– 60% Youth and Adults by 2025. Nigeria Adult literacy rate is currently 62% (2020). The long term goal is for Nigeria to get to 95% Digital Literacy by 2030.
7. Five Million Women from these various National Social Investment Programmes (NSIP)i.e. NPower 500,000 ppl; Conditional Cash Transfer 500,000 ppl; Govt. Enterprise and Empowerment Program GEEP 2.2Million ppl, National Social Register 1.8Million ppl.
8. Some form of connectivity within the communities. Underserved means served by only 1 operator

The following table 4.2 shows these targets and interim milestones envisioned to achieve the outcomes of the plan.

Table 4.2. Targets, Timelines & Interim Milestones

	Target	Measure	Baseline (2020)	2023	2025
1	**Coverage of Population**	Individuals	33% (2/3/4G)	70% 4G	90% 4G Mobile
2	**Speed (Minimum)**	Urban	3 Mbps	15Mbps	25 Mbps
		Rural	1.5Mbps	5Mbps	10 Mbps
3	**Penetration**	Number of connected individuals	Approximately 30%	50% of eligible individuals with Provision for physically challenged	70% of eligible individuals
4	**Fibre Reach Schools**	% of all schools (3 Tiers)	Nominal	70% Tertiary 30% Sec. 15% Primary	100% Tertiary Institutions 50% Secondary Schools 25% Primary Schools
	Health Facilities	% of all Major Hospitals	Nominal	Connecting 80% General/Major Hospitals per LGA and Federal Medical centres	Connecting 80% of primary health centres in each LGA. 100% General/Major Hospitals per LGA
	Local Govts.	% of 774 LGAs	473/774 (61%) of LGAs Fixed connection 10Mbps	80% of 774 LGAs	95% of (774) Local Govts. HQ connected by Fibre. 5% by Satellite/Other
	Fibre to Towers	% Towers connected	10%	40%	60% Towers connected
	Fibre Infrastructure	Open access shared Fibre	Approx. 40,000km	90,000km	120,000km non-overlapping
5	**Affordability : Data (monthly)**	2% GNI/Capita/1GB	N1000/1GB	N700/1GB	N390/1GB
	Cost of Devices	Low cost devices	Entry level smartphones at approx. $50 (N18,000)	At least 1 locally assembled Smart Device by 2023 Target Price <$50 (N18,000)	3 Local assembled Smart Devices Target Price <$25(N9,000) by 2025
6	**Digital Literacy**	% of population	62% Adult Literacy	40% Digital Literacy	60% Digital Literacy
7	**Gender Equality**	Access to end user devices and data	15% Gender Gap (GSMA)	10% Gender Gap +5 Mill Women given access	100% Women in Social security Programs have Digital Access
8	**Underserved /Rural Communities**	% of unserved clusters	114	80% of 114 unserved clusters to be covered	100% Community access or school based access in all areas

5 PILLARS & RECOMMENDATIONS

5.0 INTRODUCTION

The recommendations of the 2020 to 2025 National Broadband Plan Committee converged around four distinct pillars: Infrastructure, Policy, Demand Drivers and Funding & Incentives. Fig 5.1. The following sections detail the recommendations going forward for each pillar of development and related initiatives.

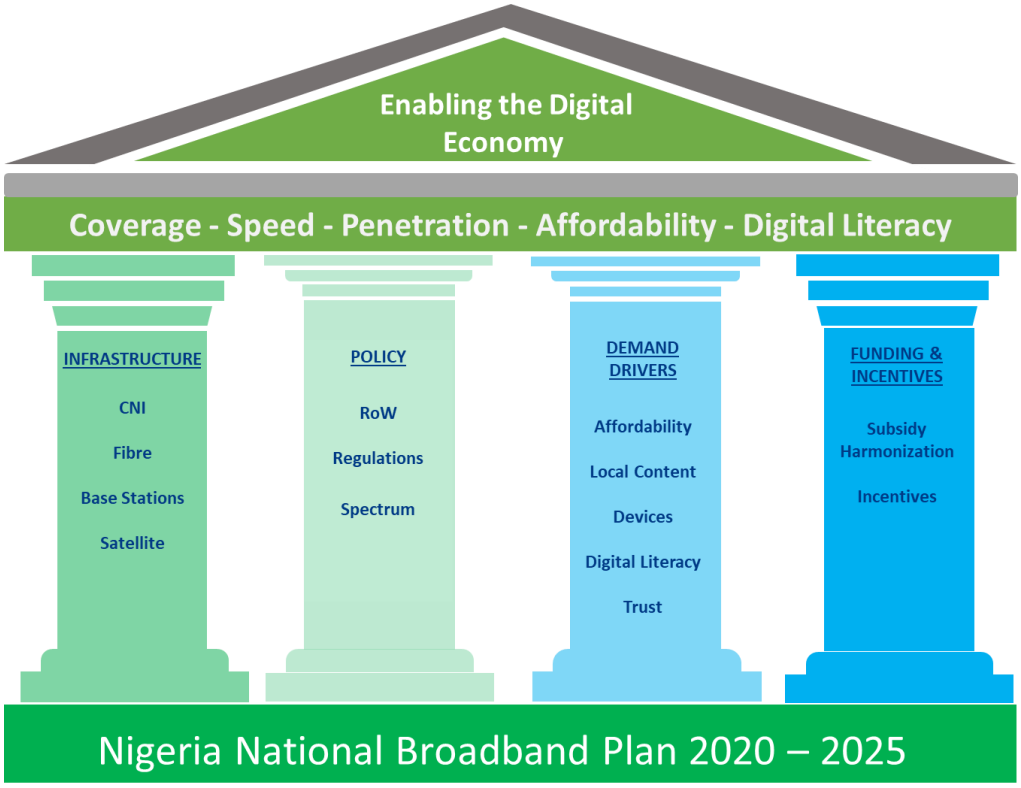


Figure 5.1 NNBP serving as Pillars upholding the Digital Economy

5.1 INFRASTRUCTURE

Infrastructure is at the very core of the success of every National Broadband Plan worldwide. It has also become obvious that one of the challenges hindering broadband penetration and service coverage in the country lies in the glaring infrastructure deficit in the telecommunications sector in Nigeria as a subset of the infrastructure deficit across the Nigerian economy. Most of the infrastructure available seems to be over-provisioned in choice areas, mainly due to overriding commercial considerations of operators in the industry. These challenges have been identified in this report and prescriptive steps have been recommended to address them.

The recommendation of the infrastructure pillar of the proposed National Broadband Plan is focused on building integrated infrastructure that is counter-part funding based, sustainable and resilient to close the gaps in addressing the broadband needs of the country. These recommendations are also geared towards extending broadband services to all unserved and underserved areas in Nigeria. The diligent implementation of these recommendations via a multi-stakeholder approach will give the country a push into economic prosperity and create opportunities for job creation and innovation. Putting the infrastructure in place will drive expanded, quality services and businesses that will influence the GDP positively.

TABLE 5.1 INFRASTRUCTURE RECOMMENDATIONS

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
CRITICAL NATIONAL INFRASTRUCTURE PROTECTION					
IN-1	**Develop CNI Database** **Broadband Infrastructure Resilience (BIR) Programs**- Identify and recommend measures to ensure resilience in the deployment of Broadband Infrastructure through deliberate programmes	**Identify, classify and designate certain broadband infrastructure as Critical National Infrastructure (CNI):** a. Recommend list of broadband infrastructure for presidential order / gazette as CNI. b. Develop comprehensive inventory of broadband infrastructure based on inputs from stake holders. c. Update already existing ONSA (CNI) portal	Q3 2020	NCC, Operators, TowerCos ONSA	Provides a comprehensive database of Broadband infrastructure to be protected by security agencies.
IN-2	**Develop CNI Strategy including Enforcing and Penalizing violations.**	**Develop a robust protection plan for broadband infrastructure** a. Develop an in-depth strategy for protection of critical broadband infrastructure and enforce consequences for those violating relevant laws. For relevant penalties: Reference the Criminal Justice (Miscellaneous Provisions) Act 1975 and Cybercrime Act 2015 in Appendices 7.2.1.1 and 7.2.1.2 respectively. b. Develop minimum security architecture for telecom sites for adoption by operators (options to include CCTV, electric fence, fire protection, security guards etc.)	Q4 2020	ONSA, NSCDC NCC, Operators, NPF(IGP)	Guarantee the physical security of broadband infrastructure.

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
		Provide inventory of broadband infrastructure for protection to DCNI at NSCDC Penalize collection of illegal charges, levies and fees on telecommunications and ICTs infrastructure, equipment and devices. Reference Taxes and Levies (Approved list for collection) Act (Amended) 2015)	Q2, 2021 as and when necessary (Ongoing)	MFBNP, ONSA/Law Enforcement Agencies, NCC, Operators	Reduces cost of deployment thereby accelerating rollout of broadband.
IN-3	**Facilitate Policy on Critical National Infrastructure**	Facilitate the issuance of an **Executive Order by the President, declaring telecoms facilities as Critical National Infrastructure (CNI).** Order to refer to description of equipment not list of equipment deployed by each operator.	Q3, 2020	FMoCDE, ONSA	Protecting telecoms equipment from vandalization, and prevention of disconnection by government officials. Will improve service and stimulate confidence for further investment.
IN-4	**Establish CNI Database – FEC Intervention Federal MDAs RoW**	**(CNI) To designate all Federal MDAs RoW as Federal Assets & Infrastructure and consolidate into a single public data base** made available to ICT service providers. On a Non-exclusive basis at rate of N145 per linear meter to facilitate rapid deployment of BB services.	Q3, 2020	FMoCDE, FEC, Ministries of Works, Transportation and Petroleum	Facilitates coverage and encourages the efficient use of public resources.
IN-5	**Prepare National Broadband Protection Report**	**Preparation of periodic national preparedness report on broadband infrastructure protection and resilience.** a. Conduct periodic threat and vulnerability assessment of each broadband infrastructure. Develop guidelines/modalities for periodic auditing of broadband infrastructure.	Bi-annually	FMoCDE, ONSA, NCC, Operators	Facilitate monitoring and implementation on protection of broadband infrastructure.
IN-6	**Broadband Infrastructure Stakeholder Summit**	**Conducting stakeholder-summit towards sensitizing relevant stakeholders in securing broadband infrastructure in the Country.**	Bi-annually	ONSA(chair), NCC (secretariat)	Create general awareness amongst security agencies on the need to protect

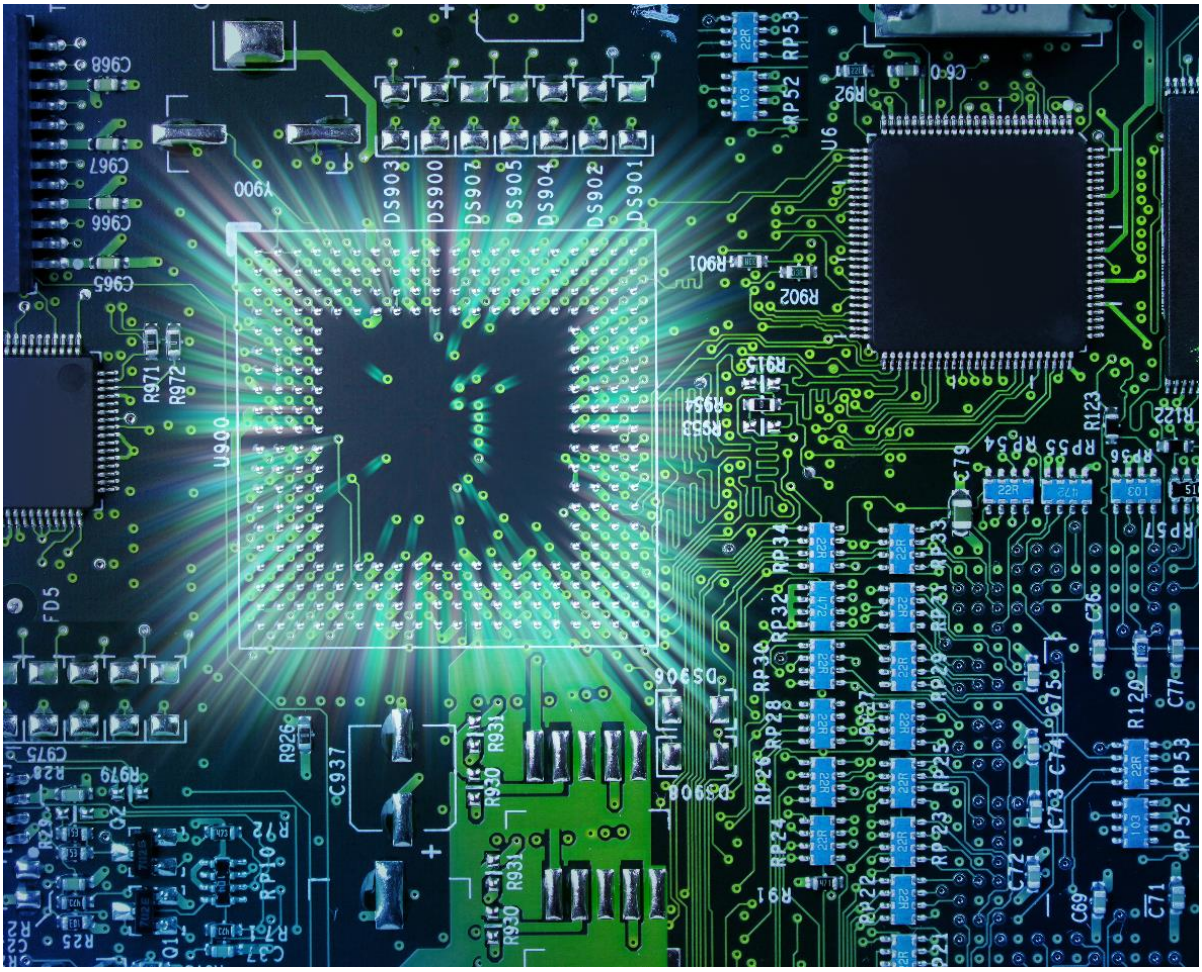
S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
		a. Sensitize security agencies on the need for the summit. b. FMoCDE/ONSA/NCC/ to organize and conduct the summit.			broadband infrastructure.
NATIONAL COMMUNICATION BACKBONE (COORDINATION, OPTICAL FIBRE CABLE CONSORTIUM)					
IN-7	**Establish Broadband Co-ordinating Unit**	**Create a regulatory guideline and establish a coordinating unit** of NCC to ensure non-duplication of fibre builds on same routes by various operators Enforce Open Access model with pricing regulations on existing and new fibre builds. Co-ordinate RoW access across various entities to facilitate approved builds.	Q3 2020	NCC	Elimination of duplicate investments, overlaps and achievement of Dig Once Policy. Promote enforcement of N145/m RoW by aligning interests between MNOs to remove opportunity for arbitrage with various government agencies.
IN-8	**Open Access Consortium**	IN-7 is deemed a priority implementation in advancing a robust national fibre backbone network. Alternative models to achieving the deployment of 120,000 km target by 2025 such as a consortium fibre build model should also be considered with wide stakeholder engagement to arrive at a workable solution that ensures the objectives of IN-7 are achieved. Recommended incentives for creation of the Consortium: • RoW waivers (National & State including FMoW, NRC, NIWA etc.) • Fibre and associated electronics Duty waivers for new build only • Pioneer status, tax waivers • Other applicable incentives	Q4, 2020	Operators, MNOs FMoCDE, NCC,MPR, NRC, FMP	National Fibre coverage to every local govt. area including less commercially viable areas with increased fibre to the tower and public venues. Elimination of duplicate investments, overlaps and achievement of Dig Once Policy. Promote enforcement of N145/m RoW by aligning interests between MNOs to remove opportunity for arbitrage with

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
		a. Issuance of Framework for consortium -sharing of capacity of Fibre cable. b. Deployment of National Self-Healing Optical Fibre Network in six (6) geopolitical zones of the country. c. Co-ordinate redundancy and interconnection between fibre and microwave at points of failure. Connect at least one (1) Optical Fibre link to each of the 774 L.G.As in Nigeria.		MNOs, NCC MNOs, NCC FMoCDE, NCC, NRC FMoCDE, NCC	various government agencies.
IN-9	**Implement Open Access & Separation of Accounting**	Implementation and Enforcement of the "OPEN ACCESS MODEL" and Wholesale price regulation/Accounting Separation a. Explicitly define Open Access Policy guideline b. Ensure all fibre is open access to other operators with price regulation c. Implement accounting separation to eliminate cross-subsidy of wholesale services with large retail operations	Q2, 2020 Q2 2020 Q3 2020 Q4 2020	FMoCDE, NCC. FCCPC NCC NCC NCC	National Fibre Coverage, Affordability
NATIONAL COMMUNICATION BACKBONE (INFRACOS)					
IN-10	**National Backbone - InfraCos**	Finalise counter-part funding for INFRACO off take. a. Implement additional 38,000km of metro fibre cable infrastructure nationwide in 2 Phases; • Phase 1: To deploy the fibre infrastructure to the Unserved areas. • Phase 1 deployment to be incentivized by granting counterpart funding upfront as areas are less viable commercially.	Q3, 2020	FMoCDE, NCC INFRACOs	National Fibre coverage to every local govt. area including less commercially viable areas with increased fibre to the tower and public venues. Elimination of duplicate investments, overlaps and

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
		• Phase 2: To take care of the remaining areas; the Underserved with funding based on milestones achieved and verified before payment is effected. b. Deployment of 100Gbps backbone capacity connectivity to the 36 states of the Federation. c. Deployment of POA @10Gbps connectivity to the 774 L.G.As in the country. Review technical spec of POA at point of rolling out. d. Review existing INFRACO model and engage Tower Cos to terminate PoA to BTS where applicable.			achievement of Dig Once Policy.
REGIONAL METRO NETWORKS AND LAST MILE ACCESS					
IN-11	**Metro and Last Mile Sharing & Building Codes**	Promote FTTx (x=[b]uilding, [c]urb, [t]ower and [h]ome) network infrastructure sharing as Last mile solution that adopts 'dig-once' policy. Review Building Regulations (National Building Codes) to incorporate FTTB and FTTH provision in all new corporate and public building, residential estates and businesses.	Q3 2020 Q4 2020	FMoCDE, ALTON, ATCON, NCC, FMW&H, State Govts. FMW&H	Most effective and future proof Last-mile approach in combination with Wireless configurations (indoors). QoS and CoS improvements = improved Customer Experience
NATIONAL INTERGRATED INTERNET EXCHANGE INFRASTRUCTURE/LOCALISATION OF INTERNET TRAFFIC					
IN-12	**Internet Exchange : Upgrade & Localise Traffic**	a. Encourage expansion of the backbone link capacity between the IXPs b. Establish an IXP presence in the North East of Nigeria c. Creation of Route Redundancy for all IXPs in Nigeria. d. Localise 80% of Internet Traffic in Nigeria with the Internet Exchange Points.	Q3 2020 Q4 2021 Q3 2022 Q4 2022	NCC (Funded by NCC & NITDA) IXPN	See footnote on local traffic below this table.
INTERNATIONAL SUBMARINE CABLE LANDING AND EXTENTION INCOUNTRY					

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
IN-13	**Submarine Cable Landing Resiliency**	a. NCC to develop a Submarine Landing Station Regulation to address the issue of redundancy and resilience on Submarine cables. Each Operator to have a resiliency plan against fibre cuts including providing redundancy on peer submarine cables. b. Creation of 100% Route redundancy for all Submarine cables landings in Nigeria to be incentivised with counterpart funding c. Develop regulations to enable **Open Access** sharing of submarine landing capacity to improve network resilience d. Creation of new landings for international submarine cables outside Lagos (e.g. Akwa Ibom, Cross River, Rivers, Delta, Edo, Bayelsa etc.) with funding support e. Define stakeholders' responsibility for the protection of submarine cable routes on the shores.	Q1 2021 Q2, 2021 Q1, 2021 Q1, 2022 Q4, 2020	NCC, ASCON FMoCDE, ASCON, CBN NCC FMoCDE Operators, CBN ASCON, NIMASA, NPA, NAVY, ONSA, NIA.	National Preparedness for Network Disaster Recovery
INTEGRATED NATIONAL SATELLITE INFRASTRUCTURE DEPLOYMENT					
IN-14	**National Satellite Broadband Deployment**	Leverage on the existing NIGCOMSAT Space segment capacity and Broadband shared service infrastructure in C, Ku and Ka-band, with funding support from USPF Rural Broadband initiative (RUBI) and NITDA Fund for ICT development to : (a) Deploy broadband/internet services up to 10Mbps per site to over 3,000 cluster groups: Providing connectivity to Schools, Community Telecentres, and hospitals in the difficult to reach areas.	Q3 2020	FMoCDE, NIGCOMSAT, USPF, NITDA, GBB	To accelerate broadband penetration to the rural and difficult to reach areas and ensure rapid even spread

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
		(b) Provide mobile backhaul solutions up to 15Mbps per site for 700 rural BTS sites for the coverage of the difficult to reach areas • Border communities should receive specific funding in line with BCDA remote communities development plans. • Government should align requirements for border broadband intervention (within 1-2Km distance from all border posts) with the development of the national backbone network.		CBN	



5.2 POLICY

Well-conceived policy and regulatory prescriptions are fundamental to the optimal rollout and uptake of broadband services. This will attract investments by incumbent and aspiring service providers and ensure transparency in the regulatory process. Such an environment favours all stakeholders: government gets to meet its developmental objectives, service providers enjoy a favourable business environment for profitability and subscribers get to enjoy good and innovative services.

Harmonized Right of Way/Site Acquisition policies and an enabling environment for constructing and protecting broadband infrastructure will greatly accelerate the rollout of broadband services.

Spectrum is a scarce commodity which when inefficiently utilized greatly limits broadband coverage and speeds due to artificial constraints. Efficient use of spectrum, right of way, site acquisition policies, availability of infrastructure and market efficiency are some of the issues addressed by the policy and regulatory pillar. For optimal use of spectrum, licensees have the obligation of the Use it or Lose It Policy. Licensees may also leverage the subsisting Spectrum Trading guidelines, however idle high demand spectrum does a disservice to poorly served populations and should be released for effective use as may be required

For the purpose of this exercise, tasks have been assigned to relevant Ministries, Regulatory agencies, Parastatals as well as to State Governments, noting the relevance of the latter in the federal structure of government that obtains in Nigeria. The service providers are equally expected to facilitate the attainment of the aspirations of policy integration with State governments by demonstrating buy-in through definite interventions.

Table 5.2. RECOMMENDATIONS ON POLICY AND REGULATION

S/N	FOCUS AREA	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
RIGHT OF WAY - FEC/NEC INTERVENTIONS					
P-1	**Implement National Standardized RoW Fees - NEC/FEC**	Top-level engagement directly driven by the Hon. Minister with the Vice President, (NEC chairman) and the Nigeria Governors Forum to negotiate the implementation of the N145 per linear meter RoW fees resolution in all 36 states. Develop a framework to encourage operators to collaborate and stay within the agreed RoW fee of N145N/m.	Q3, 2020	HM FMoCDE, NEC,FEC,NCC NCC	Get state governors buy-in to the streamlined (reduced) RoW charges. Unimpeded fibre roll out in the states.
P-2	**Incentivize RoW with USPF/Social Funds - NEC/FEC**	Adopt an approach to incentivize the implementation of State's adoption of N145/Linear Meter for Right of Way. (e.g. rewarding states with USPF social intervention projects around security, health and education)	Q3, 2020	Federal Executive Council/NEC	Cost reduction of, and encourage the deployment of shared

		Non-compliant states should be denied government interventions.		FMoCDE, NCC, NITDA, GBB	broadband fibre infrastructure.
INFRASTRUCTURE ASSET SHARING					
P-3	**Federal Infrastructure Asset Sharing Guidelines**	To leverage all Federal Infrastructure assets (street lights, buildings, etc.) and make available to ICT service providers to facilitate rapid deployment of BB services. Guidelines for such approvals need to be developed and include the following conditions: • Issuance to licensed operators with specific service deployment plans only • Plans must allow for sharing with other service providers • Any such rights granted will be subject to a "use it or lose it" mandate within a specified period	Q3, 2020	FMoCDE, FMW&H NCC, FCTA	Facilitates increased coverage and encourages the efficient use of public resources.
DUCTS DEPLOYMENT POLICY					
P-4	**Duct Network Development/ Dig Once Policy**	Adopt the "Dig Once"[1] policy across the country. (Definition Appendix 7.0 No. 31) Integrate policy framework with NCC coordinating body supervising fibre builds. Develop a policy that will ensure that provision for ducts are incorporated in road designs. Develop a framework that will encourage State &Local Governments to build/provide for ducts along community roads.	Q4, 2020	FMoCDE, NCC, FMW&H National Council of Works	Facilitate the delivery of broadband services to unserved and underserved areas. Entrench the "Dig Once" policy and ensures that cables laid along roads are better protected.
P-5	**Fixed Internet Services – FTTB Ducts Regulation**	To develop and enforce regulations that will ensure the provision of fibre ducts in all building plans.	Q4, 2020	FMW&H, Urban Developmen/ Development Control Agencies at Federal and States level.	Availability of fixed broadband services to homes and offices.
TOWER DEPLOYMENT POLICIES					
P-6	**Site Acquisition: One-stop Shop Approvals**	Requirement for each State to establish a One-stop shop to deal with site approval/permitting process & issues rapidly.	Q4,2020	FMoCDE, NCC	Coverage, Penetration, Speedy rollout of broadband services
P-7	**Site Acquisition Permits Intervention :**	Define guidelines for smart and aesthetic solutions to address the reluctance of the FCTA and planning authorities in major cities like Lagos	Q4,2020	Site Acquisition Permits	Accelerate issuance of

	Federal Capital Territory and other major cities	and Port Harcourt to issue necessary site build permits.		Intervention : Federal Capital Territory and other major cities	necessary site build permits.
P-8	**Harmonize Process and Establish uniform framework for Tower Related Taxes, levies, import duties & fees**	HM FMoCDE /EVC NCC to engage the Joint Tax Board (under the FIRS) to motivate for an Order amending the Taxes and Levies Act of 2015 as applicable to towers as follows: a. List out the taxes related to telecommunications towers b. Adopt a uniform approach to the tower related taxes determined under (a) above. c. Require each State to establish a one stop shop for the payment of tower related taxes. Ensure improved co-ordination and harmonized taxes through awareness creation of the strategic importance of Telecoms infrastructure to socio-economic development in order to avoid multiple and conflicting regulations and charges across Govt. agencies.	Q4, 2020 Q2, 2021 as & when necessary (Ongoing)	HM FMoCDE / EVC NCC, Minister of Finance on the advice of the Joint Tax Board. FIRS FMoCDE, FMFBNP, FMT, FMW&H, JTB, NCC, USPF, NIWA, NRC, State & Local Govts.	Quick and speedy roll out of broadband services.
P-9	**Accelerate Telecoms Equipment Import Clearance**	HM FMoCDE, EVC, NSA and CG Customs to get the NCC, ONSA and DSS to develop a framework that will ensure the processing and issuance of EUC within 45 days. Accelerate telecommunications equipment import clearance process which now requires an End User Certificate (EUC) to be attested to by ONSA and DSS separately.	Q1, 2021	HM FMoCDE /EVC NCC, ONSA, DSS	Timely issuance of EUC and rapid rollout of broadband services.
P10	**Enhance regulation of Tower Cos.**	To effectively regulate anti-competitive practices in broadband related market segments of the industry by: Review vertical agreements between tower infrastructure services providers and mobile operators for provisions on exclusivity and market carving; recommending appropriate remedies. Require pre-approval and publication of standard/reference offers for services by tower infrastructure providers to ensure impartiality and transparency, in view of the critical nature of such service; almost as important as interconnection.	Q4, 2020	NCC	To arrest anti-competitive behaviour in the tower infrastructure segment of the industry, which slows rollout.
LOCAL CONTENT POLICY					
P11	**Local Device Assembly Policy**	To encourage the local assembly and manufacturing of at least one device brand by granting pioneer status to credible manufacturers.	Q1, 2021	FMoCDE, Ministry of Trade and Industry	• Improve affordability • Reduce capital flight

		Encourage local manufacturing and component input and sourcing in telecoms industry where it is available and makes sense			• Create jobs /capacity building.
GOVERNANCE & MONITORING POLICY					
P12	**Policy on Pre-Project feasibility and assessment studies**	Establish policy framework to conduct detailed and formal feasibility studies in respect of every proposed broadband intervention.	Q2, 2020	FMoCDE, BB Monitoring council	Better co-ordination and elimination of overlaps and ensuring sustainability of BB interventions
P13	**Establish Broadband Monitoring & Reporting Committee**	Establish a standing Broadband Monitoring & Reporting Committee that is domiciled in the Minister's office	Q2, 2020	HM FMoCDE	Ensure tracking of the NNBP implementation Provide milestone updates on progress or otherwise.
P14	**Introduce Broadband State Ranking Report**	Introduction of state ranking on digitalization/ broadband penetration based on objective and verifiable indices. To be published annually. These indices include • Percentage (%) of connected towers to fibre • % of Schools connected to fibre • % of Hospitals connected to fibre • Availability of up-to-date Website • Availability of intranet in the public service • Availability of e-Government Applications • E- Government Integration (State and Local Governments) • Low tariff on Right of Way • One stop for ICT Telecoms related approval • Support for ICT innovation and Entrepreneurship • Support for ICT Local Content.	Q4, 2020	HM FMoCDE	Encouraging states to improve on ICTs and Broadband coverage. Greater ease of doing business in states Improving digital literacy.

TABLE 5.2.1 RECOMMENDATIONS ON SPECTRUM

S/N.	FOCUS AREA	RECOMMENDED INITIATIVES	Timeline	Responsible	Impact
PS-1	**Promote Efficient Use of assigned Spectrum**	Enforces diligently ***"Use it or Lose it"*** Policy on Spectrum and conduct quarterly assessment with reporting to the HMC&DE on enforcement actions. The '***Use it or Lose it***' rule should apply in all instances where assigned spectrum is found to be non-utilized or underutilized. Penalties should include: • Forfeiture, which may be partial in relation to uncovered areas, and relative to rollout obligations extending to total forfeiture in the event no rollout is implemented in line with license obligation • Regulator may also consider a ban on application for spectrum for the next 10 years after revocation of license or additional penalties for non-fulfilment of license obligations	Q4, 2020	NCC	Availability of spectrum for efficient use.
PS-2	**Active Infrastructure Sharing Framework**	Implement Regulatory framework on Active Infrastructure Sharing whilst ensuring infrastructure deployment is not slowed down or impeded. Deployed infrastructure, including active network components such as radios, cables, core network elements, etc., can be shared	Q4, 2020	NCC	To facilitate the efficient use of spectrum. Accelerate multi operator coverage presence
PS-3	**National Roaming Framework**	Implement Regulatory framework for National Roaming, whilst ensuring that the infrastructure growth is not slowed down or impeded	Q4, 2020	NCC	Ubiquitous access to broadband services in areas covered by a network, regardless of service provider.
PS-4	**Transparent Assignment of Spectrum**	Adopt open and transparent processes and methodologies when assigning spectrum by publishing methodologies in advance and issuing public notices on the assignment of spectrum on the NCC website Role and scope of agencies involved in spectrum management should be clearly defined and enforced by HM FMoCDE. • The NFMC not to exceed its statutory mandate of bulk allocation of frequencies. To desist from single assignments. • NBC should focus on regulating content • NCC to regulate technology and spectrum for telecom services	Q4, 2020	NCC Presidency, FMoCDE, NFMC/NCC	• Transparent processes in the assignment of spectrum • Building of investor confidence for the acceleration of broadband funding • To ensure compliance with the statutory prescriptions

S/N.	FOCUS AREA	RECOMMENDED INITIATIVES	Timeline	Responsible	Impact
					on roles/functions allocation in the frequency spectrum management regime. • Certainty of national frequency plan.
PS-5	**Review the Spectrum Trading Guidelines of 2018.**	To review spectrum trading guidelines in order to ensure unutilised spectrum is fairly traded and to facilitate rollout by other operators. Consider modification of the Spectrum Trading Guidelines 2018 to ensure that Arbitrage opportunity is either completely eliminated or reduced to minimal level that will discourage abuse. In particular, for all administratively assigned Spectrum, the new secondary sale proceeds distribution ratio could be increased in favour of the FGN as against the current 60:40 regime. Adopt open transparent processes for Spectrum trading between parties. In the immediate instance, a six month period should be given to all operators with underutilized spectrum prior to enforcement of the "use it or lose it" or alternatively, "trade it" before a more stringent spectrum trading guideline is adopted. Review the Competition Practices Regulation 2007 to ensure that value of Spectrum is easily Identifiable in any Merger and Acquisition such that a higher ratio may be adopted when it comes into effect. Every Spectrum asset should be accompanied by its liabilities when sold.	Continuous Q3, 2020 Q4, 2020	NCC HM FMoCDE, NCC NCC, Operators	To facilitate the efficient use of spectrum. Free up spectrum resources to fast track implementation of broadband goals Conformance to the law with respect to transparency and competition. Efficiency of spectrum management Curtails federal revenue haemorrhage Restores investor confidence in Telecoms industry.
PS-6	**Spectrum Pricing**	Adopt flexible and innovative spectrum pricing framework that lowers the cost of Last-mile and backhaul spectrum such as: • Doing away with some component of spectrum fees in exchange for commitment to rollout in specific unserved/underserved areas Spread payments of spectrum fees across the lifetime of the license.	Q4, 2020	NCC	Free up capital to foster infrastructure deployment

S/N.	FOCUS AREA	RECOMMENDED INITIATIVES	Timeline	Responsible	Impact
PS-7	**Clearance of encumbrances on 700MHz and 2.6GHz frequency bands**	NFMC to mandate NBC to clear all broadcasting stations from the700MHz and 2.6GHz bands. Government to release the required funds in order to vacate licensees that are currently on the700MHz and 2.6GHz frequency bands for the deployment of telecom infrastructure	Q1, 2021	NFMC, NBC, NCC, FMFBNP	Increased coverage/efficient use of spectrum Improvement on Quality of Service.
PS-8	**Deployment of Television White Spaces for broadband**	Conclusion of the outstanding consultation process and the enactment of guidelines on the use of Television White Spaces for internet services taking into account the work of ITU on WRC 2023.	Q4, 2020	NFMC , NBC, NCC	Accelerate deployment of broadband services including underserved areas
PS-9	**Spectrum Planning for the future**	Develop a forward-looking Spectrum Roadmap to include; • Emerging opportunities and challenges to radio spectrum management at least 3 – 5 years into the future. • Identification of future technological trends and emerging standards, as well as assessment of their impact on spectrum policy and planning • Establish programs to monitor the implementation of the proposals herein. • Periodic updating and publishing the spectrum plan and National Frequency allocation table (At least on an Annual basis).	Q4, 2020	NFMC, NCC, NBC	Assurance of adequate spectrum to meet demand for wireless broadband. Provide long term planning guidance to operators for technology deployments and capital investment
		Plan and release IMT-2020 spectrum including 3.5GHz band with guidelines to promote quick deployment of FWA (fixed wireless access) for affordable high speed connections to critical demand locations before fibre deployment.	Q3 2020	NFMC, NCC	Very high-speed connections to key locations and institutions, offload the mobile network
		Encourage the re-farming of 900MHz and 1800MHz bands to unlock greater efficiency in the deployment of 3G/4G services nationwide. In particular, if slots becomes available, re-plan the band in slots of 10MHz on the 900MHz band and 20MHz on the 1800MHz band. Assign 2100MHz spectrum to the industry for broadband (L2100).	By Q2, 2021. By Q1, 2021	NCC NCC	The quickest route to fast coverage of 3G and 4G networks across the country within months. Facilitate roll out of broadband services.
		Participate actively in the ITU's work on preparation of channelling plan for the recent allocated 5G IMT spectrums such as 26GHz	Engage and adopt upon	NFMC/ NCC	Early provision of 5G benefits to

S/N.	FOCUS AREA	RECOMMENDED INITIATIVES	Timeline	Responsible	Impact
		(24.25 – 27.5GHz), 40GHz (37-43.5GHz), 45GHz(45.5 -47GHz), 47GHz (47.2 -48.2 GHz), and 66GHz (66-71Ghz) with a view to making the spectrums bands available to the end users by 2021.	conclusion by ITU.		Nigerian subscribers.
		Participate actively in the ITU's study on 600MHz band as well as 3.6GHz- 3.8GHz band towards WRC- 2023.	Engage & adopt upon conclusion by ITU	NFMC/ NCC	Position Nigeria to identify new spectrum for wireless broadband.
		Implement regulatory provisions revised by the ITU on RLANs to accommodate both indoor and outdoor usage of Wi-Fi of the 5GHz band.	Engage & adopt upon conclusion by ITU	NFMC/ NCC	Make spectrum available for Wi-Fi.
		Consider the yet unassigned spectrum and retrieve unutilized broadband- relevant spectrum under "Use it or Lose it" guidelines from MDAs for purpose of the NBP implementation in the 450MHz, 700 MHz and 1400 MHz bands.	Q4, 2020	HM FMoCDE, NFMC	To prevent sub optimal use of and rent – seeking with frequency spectrum and to make such retrieved spectrum available for broadband deployment

Further notes on spectrum allocation recommendations are included in Appendix 7.

5.3 DEMAND DRIVERS

Some of the factors identified as barriers to the low usage rate and adoption of broadband services include the high cost of services and access devices, low digital literacy, lack of local and relevant content and poor perception of broadband value, amongst others. Effective utilisation of broadband services requires the use of capable devices such as smart phone, tablets, PCs etc. The cost of these devices is typically higher than what a large segment of the population can afford.

In view of the above, it is important for government to take steps to fast track the adoption of broadband services and access devices by incentivising local assembly of Smart phones with pioneer status and other waivers of duties, taxes, and levies – with a target of getting smart phones to Nigerians at below $25 by the year 2025. Adequate digital literacy programs should be embarked upon to enlighten every Nigerian on the relevance of broadband to their lives and day to day activities.

The Federal Government needs to push for localization of internet content within the shores of Nigeria. This would lower the cost of Internet access, improve the quality of service (QoS), reduce capital flight, create job opportunities, and protect the sovereignty of the Nation. The government should equally mobilize resources towards the development of digital (educational, vocational and entrepreneurial) content in local languages for citizens' empowerment. Broadband services need to be safe, secure and convenient for use and protect citizens' sensitive information and transactions. In summary, the demand drivers initiatives recommended below fall under the following categories: Affordability; Digital Content; Literacy & Awareness; and Trust.

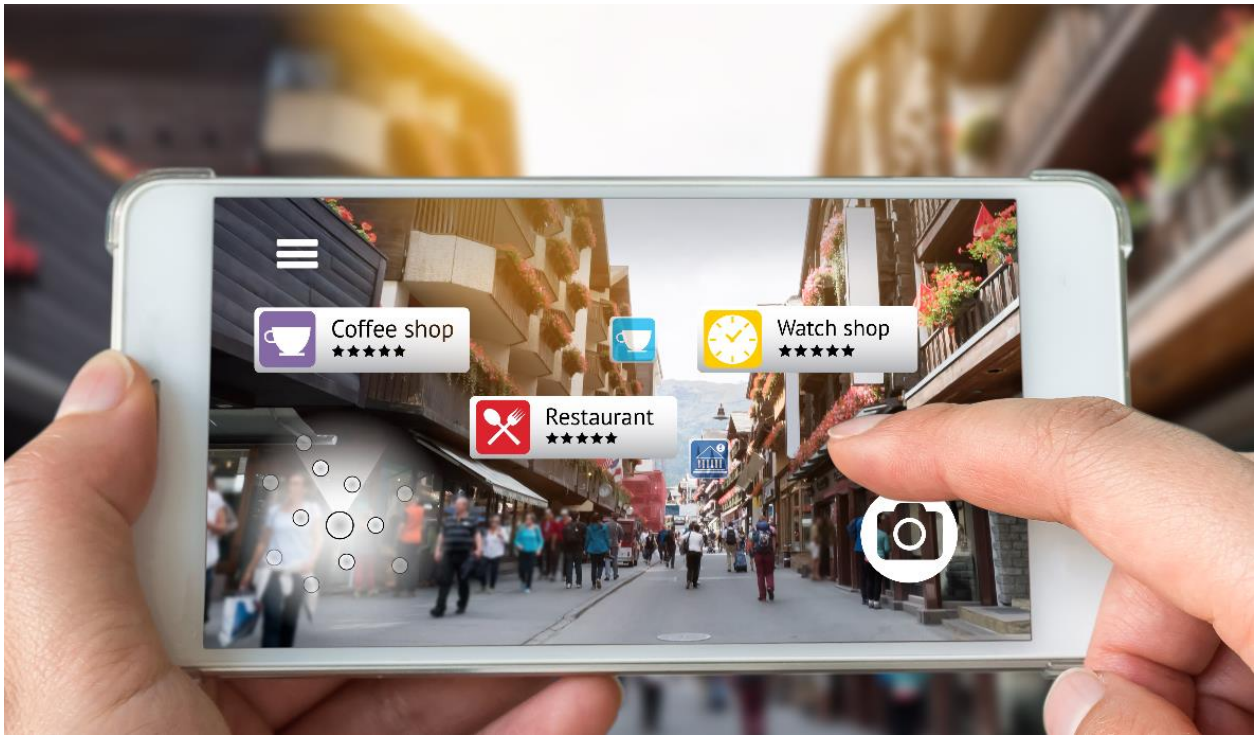


Table 5.3 DEMAND DRIVER RECOMMENDATIONS

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
AFFORDABILITY					
D1	**Affordability – Incentivise low cost smart devices**	Incentivise OEMs sub $25 smart phones and sub $40 tablets- through reduction/waiver of duties and other incentives 2020: Development of implementation framework and standards with potential OEMs. 2021: Licensing of OEMs based on Agreed Framework and Incentivize Local Manufacturing with Focus on Budget 3G/4G Smart phones 2023: Local assembly of smart phone for <$50 2025: Local assembly of smart phones for <$25	Q3, 2020 Q2, 2021 Q1, 2023	FMoCDE, FMT&I, CBN and NCC	Zero-rate taxes or reduction/waiver of duties, etc. (for a set period of time) on standardized (SAR=1.6W/kg) budget smart devices can result in reduced costs. Create local jobs Protect local OEMs
D2	**Expand Women's' Social Investment Scheme**	Social Investment Scheme (via an Instalment Payment or Intervention Scheme) to Expand the Less-Privileged and Women's Access to Smart phones and Devices 2020: Development of the Framework by NSIP 2021: Roll-out of a Pilot Scheme to Cover Selected LGAs in Each of the States 2022: Full Roll-out Nationwide to Target 5 Million Women by 2025	Q3, 2020 Q2, 2021 Q1, 2022	FMoCDE NCC, FMHDSD	Improving access and affordability will drive digital inclusion and close the gender gap.
D3	**Implement Student Device Affordability Schemes**	School Support System to Ensure Access to Smart Access Devices by Students of Primary and Secondary Schools and Ownership by students of Tertiary Institutions 2020: Development of Implementation Framework Based on Needs for the Different Levels 2021: Take-Off of the Scheme with selected schools across the Country: Target (2021-2025): Primary Schools: 25% Secondary Schools: 25% Public; 100% Federal Unity Schools. Colleges of Education, Polytechnics, Universities: 25% State; 50% Federal Leverage NYSC participants to foster Digital Literacy in schools around the country	Q2, 2020 Q1, 2021 Target 2021-2025	FMoCDE, NCC, NITDA, FME	Higher levels of digital literacy and awareness Ownership of smart devices by students of tertiary institutions will boost Increased demand for broadband Create a pool of IT savvy graduates ready for the digital economy within and outside the country
DIGITAL CONTENT					

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
D4	**Promote Local Hosting of Nigerian Websites & Content**	Government to Lead the Way by Hosting all Government Data Locally (Data Sovereignty)	2020-2022	FMoCDE, NITDA,GBB	Increased affordability and, improve quality of service (QoS), create jobs and protect sovereignty of the Nation.
D5	**NIRA Free domain registration**	Collaboration between NIRA (.ng registry) NITDA and CAC towards getting more Nigerian businesses online. Assign a free .ng domain to every new business registered with CAC for first 2 years after registering.	Q4, 2020	NIRA, NITDA, CAC	Promote local content development, job creation and expand online business opportunities for Nigerian companies. Global visibility for Nigeria.
LITERACY AND AWARENESS					
D6	**Digital Indigenous Language Content**	Development of digital (educational, vocational and entrepreneurial) content in local languages for citizens empowerment to leverage opportunities created by Broadband	Q3, 2021	FMoCDE, NITDA, FME, State Governments	Digital literacy in local languages and increased demand amongst non-English literate population
D7	**Digital Literacy Training and Awareness**	Develop or adopt an explicit Digital Literacy standard with coherent training and requisite certification for duration of the plan. Fund the implementation of the Digital Literacy Program. Create a national awareness campaign to highlight the value of digital literacy skills.	Q4, 2020 Q2, 2021	FMoCDE, NITDA, FME, State Governments	Digital literacy and increased demand
D8	**Digital indigenous language translation to Audio**	Develop and implement an enhanced national digital virtual e-library, that will: • Provide access to digital books including audiobooks; video, instruction manuals and public service information • Developing of local digital content: a. Converting existing local language printed books to audio b. Translate foreign languages audiobooks to local languages Access to free online classes- skill building and related platforms.	Q1, 2022 Q1, 2023 Q3, 2024	FMoCDE, FME, NITDA	Digital Literacy and increased demand in local languages and culture
D9	**e-Government initiatives**	Effective digitisation of Government services (e-Government) as well as other services (e-Agric, e-Health, e-Education, e-Commerce, etc.) to attract citizens.	2023	FMoCDE, NITDA, GBB, State Govts.	Promote broadband use for e-Govt. services Increase efficiency, reduce leakages and

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
					promote transparency. Create job opportunities
D-10	**Deploy Community Access Centres**	Strategic Deployment of Community Access Centres & ICT Training Centres (based on need and gap analysis) – To leverage NIPOST infrastructure across the country. Leveraging on existing infrastructure for paid services will reduce Cap-Ex costs and enhance sustainability.	2022	FMoCDE, NITDA, NCC, USPF, NIPOST, Local Govts., State Govts.	Increased and affordable digital and financial inclusion.
TRUST					
D-11	**Establish Consumer Awareness and Safety Initiatives**	Consumer Awareness Initiatives NCC to expand and upgrade the existing central database for the reporting of National Consumer Complaints internet related issues To Develop a National Internet Safety Program (NISP) • Develop and Implement Citizen Online Safety & Protection Campaign	Q4, 2020 Q1, 2021	NCC, FCCPC NCC, FCCPC, NITDA	Increased usage and high demand Effective management of consumer complaints to build trust and confidence of internet users Internet safety awareness
D-12	**e-Govt Inter-operability framework**	Ensure implementation of Nigeria e-Government Interoperability framework (Ne-GIF). Create portal for Single sign-on details for all government services. PEBEC to finalize framework for integration and access to Government services. GBB to provide Interface, NIMC to serve as custodian for citizen data. Harmonize SIM user database with NIMC database.	2020-2022 Q4, 2022 Q4, 2020	NITDA GBB, NIMC NCC, NIMC	Increased demand for broadband services.

5.4 FUNDING & INCENTIVES

Some of the challenges that hindered the full achievement of the 2013-2018 Nigerian National Broadband Plan include ineffective implementation and funding, with an over reliance on government programs in a market where telecom is largely funded by the private sector.

To this end, the Committee reviewed the objectives of the new broadband plan with a view to identifying relevant financial incentives, fiscal policy, economic models and funding options to help the achievement of broadband penetration targets. Recommendations for achieving these targets have been articulated in the table below:

Table 5.4 FUNDING & INCENTIVES RECOMMENDATIONS

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
F1	**Funding of National & Regional Backbone Infrastructure**	Accelerate the establishment of National and Regional backbone infrastructure under an Open Access Model **Recommendations:** **Establishment of Seed Fund** for integrated infrastructure deployment, co-ordination and facilitation. Co-ordinating council to co-ordinate operators regarding integrated infrastructure deployment and open access initiative. Review and harmonize existing and proposed integrated infrastructure builds proposed under the infrastructure pillar. E.g. Fibre and Base stations Access international funding sources where available	Q1, 2021	FMoCDE, NCC FMoCDE, NCC Stakeholders	Increase national and regional coverage. Increased demand and speed
F2	**Harmonize the processes for issuance of RoW relevant permits.**	Stakeholder collaboration/financial incentives on a harmonized process for the issuance of RoW Permit**.** Develop a standardized procedure to incentivize free RoW permit by Federal, States and Local Government through Connection of public institutions within 1Km distance of deployed infrastructure. Agree on building of ducts for new construction by Federal, States and Local Governments for lease to Operators at standard rates.	Q3, 2020 as and when necessary (Ongoing)	FMoCDE, NCC Stakeholders: NEC , FMFBNP, ICRC, FMW&H, NIWA, NRC, FMT, State & Local Govts., Communities FMoCDE, FMW&H NCC, USPF NITDA, STATE MoW	Increased Broadband penetrations

S/N	FOCUS AREAS	RECOMMENDED INITIATIVES	TIMELINE	RESPONSIBLE	IMPACT
F3	**Increase subsidy and incentive**	Review the current USPF subsidy model. Increase in subsidy/ incentive. Development of a sustainability model to incorporate both CAPEX and OPEX in the subsidy regime when and where necessary.	Q3, 2020 Q1, 2021 Q1, 2021	USPF, NCC	Accelerate coverage of unserved areas
F4	**Incentivize local devices:**	Encourage production/assembly of telecommunication/ICT end user equipment and devices locally through reduction/waiver of duties on imported equipment, components and parts, etc. Grant of pioneer status to interested investors for the production/assembly of telecommunication/ICT end user equipment and devices. Reduction/waiver of duties, taxes and other charges on telecommunication/ICT equipment, devices and components. Incentivize OEM sub $25 smartphones and sub $40 tablets. Include components and other devices.	Q3, 2020	FMFBNP, FMT&I FMoCDE, MFBNP, JTB, NCC, USPF, FMFBNP NCC	Improve affordability and increase demand Create job opportunities
F5	**Funding skills building & Innovation**	Identification and selection of targeted solutions for time-based competition by different categories of innovators Set up funds to encourage innovation and development of new technologies	Q1, 2021	FMoCDE, NITDA**,** NCC	Create job opportunities and stimulate demand for broadband
F6	**Secure alignment of state and local governments on broadband penetration**	Federal government to consciously get the buy-in of the state and local governments to support broadband penetration. Fund Provision of ICT tools and devices to selected public establishments located in the State. NITDA should establish funds for manpower development as well as incentives for the acquisition of devices including special devices for physically challenged persons. Government to authorize the upgrade and use of public institutions as Public Access venues especially NIPOST outlets. Government to increase funding to GBB to provide access to all the Public Institutions from Primary to University/ Polytechnic level.	2020-2021	FMoCDE [NCC, USPF, SG, LG] CBN, FMFBNP, NITDA HM FMoCDE, NIPOST FMoCDE, GBB, FMoE,	Faster and low cost of deployment of broadband infrastructure Increased demand for broadband services

		Direct Governments Institutions to use NIGCOMSAT Communications Satellite Resources with right of First Refusal where satellite communications is required		TETFund, SUPEB HM FMoCDE, NIGCOMSAT	

Further recommendations under Study and benchmark models adopted in other jurisdictions where broadband has been deployed and adopted successfully. See Appendix 7.2.2


CUSTOMER SERVICE LEVELS
CHECK FILES
SERVICE LEVELS AND STATIS
TIME SCALE
FINANCE
BIG DATA
NEW BUSINESS
NEW BUSINESS
MARKET MEDIA
NEW INFORMATION
NEW CLIENTS

6 GOVERNANCE & IMPLEMENTATION FRAMEWORK

6.0 FRAMEWORK DETAILS

A strong governance and implementation framework will be essential to ensuring the NNBP is brought from concept to reality by the identification and appointment of a capable and driven project delivery team.

Beyond the specific requirements for the implementation of the broadband plan, there is the need for improved alignment between Government and the industry. This will ensure that the policy objectives of government are better aligned with the plans of the major players in the industry. In order to realize this objective, the Plan makes provision for instituting a Ministerial Advisory Panel led by the Honourable Minister of Communication and Digital Economy and consisting of CEOs of major private and public sector players in the Nigerian telecoms market.

In addition to the broader scope of this Ministerial Advisory Panel, it is recommended that implementation of the plan be led by a multidimensional, multi-stakeholder steering committee which will monitor and direct overall progress with accountability to the Minister.

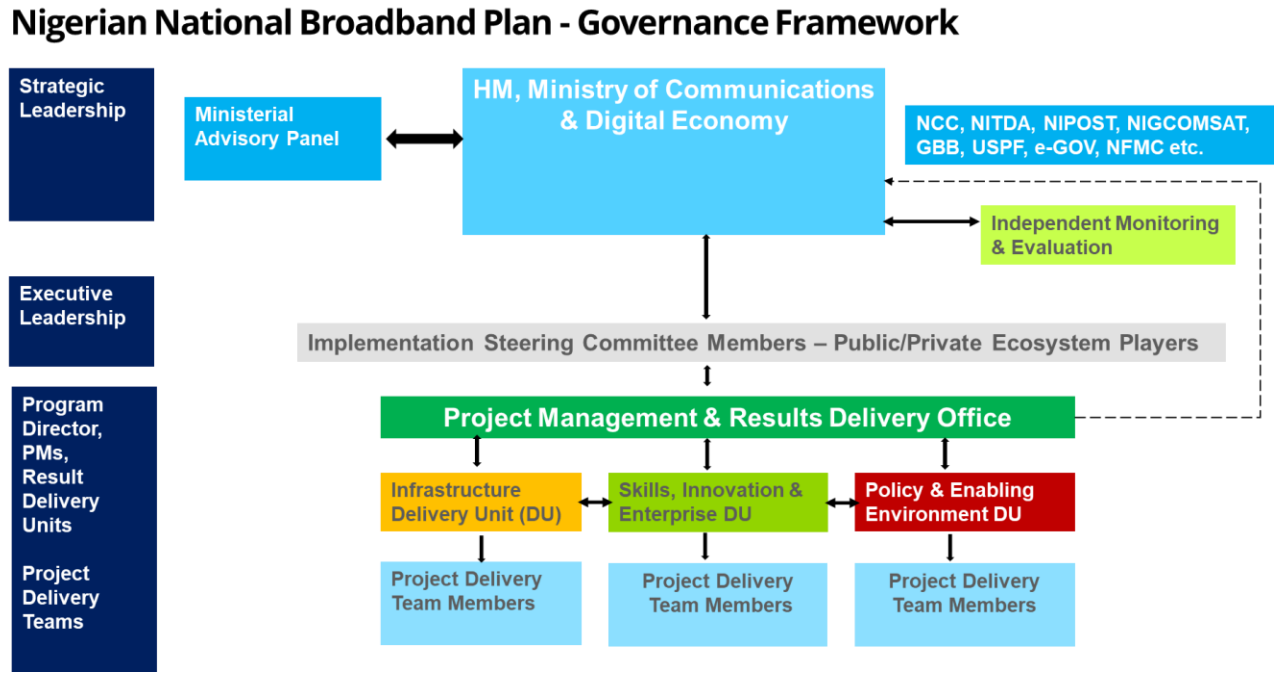


Figure 6.1: Nigerian National Broadband Plan – Governance Framework

Ministerial Advisory Panel

The Ministerial Advisory Panel has a critical role to play in ensuring the alignment of interests and achievement of the broadband plan in partnership with the Honourable Minister. Considering that telecommunications is largely privatized in Nigeria and that the achievement of the broadband plan will be heavily dependent on private investment and alignment of private and

public sector interests, open and frequent engagement between government and the very senior leadership of the major Telecom companies will be required to ensure successful outcomes.

Ideally, all these parties would have benefits to be derived from achievement of the plan, for the government, realisation of developmental objectives and for private sector, expansion of the broadband market in Nigeria. As such, Government will need to work closely with these private companies to ensure the enabling environment is created for the requisite levels of investment that would ensure realization of the plan. In addition to the Minister, the Panel should include the Telecoms regulator and other senior leadership under the Ministry of Communications & Digital Economy.

It is recommended that this Panel be set up immediately and meet on a quarterly basis.

Broadband Implementation Steering Committee

The Broadband Implementation Steering Committee should be established by the Honourable Minister within 1 month of the NNBP 2020-2025 approval by the Federal Government, with the overall responsibility for ensuring the implementation of the broadband plan. The Steering Committee should own the approved broadband plan document, develop the terms of reference for the Project Management Office and Delivery units, define the staffing requirements and recommend candidates for each of the project delivery teams and manage overall changes to the plan.

This Committee will report to the Honourable Minister of Communications and Digital Economy and the National Digital Economy Council, which has been established to oversee the implementation of the National Digital Economy policy and strategy.

Membership of the implementation steering committee should be limited to no more than 12-16 members and should include public and private sector representatives across the broadband ecosystem including regulators, supply and demand side players and associations.

It is imperative that stakeholders cut across all national geographic zones, State Governments and FCTA. The critical agencies responsible for the implementation of the plan including NCC, NITDA, GBB, NGCOMSAT, USPF, will be effectively represented in addition to nominees of relevant ministries such as Ministry of Transportation, Ministry of Works & Housing etc. Representation of International Development agencies/ Not-for-Profit bodies will be useful to provide guidance in line with the achievement of UN SDGs, international development and global best practice.

Project Management and Results Delivery Office (PMO)

The implementation delivery units should report to a Director level nominee under the Minister who will serve as day-to-day project lead for delivery of the broadband plan and should be specifically tasked with KPIs in line with the implementation objectives. The Programme Director will head the PMO function and have overall accountability for achieving the outcomes of the

broadband plan. The PMO will define the project management approach and standards, reporting guidelines for the various project delivery units, handle change management requests and assist in decision making regarding prioritization, dependencies, funding and resourcing of the various result delivery units.

The project delivery teams will provide monthly progress reports, which will be collated by the PMO, and team leads will meet with the Steering Committee on a Quarterly basis.

In order to build confidence with the public, KPIs should be simple and transparent with progress reports published on a website or in the newspapers every 6 months, after review and sign off by the independent monitoring and evaluation team.

In order to ensure success of the plan, the PMO will also need to drive effective communications of the plan to various stakeholders including all arms of government, private sector, civil society and local communities.

Project Delivery Units (PDUs)

Delivery unit KPIs should be based on the subcommittee recommendations and project activities will be aligned to achieve the desired outcomes through clear mapping of objectives. Three delivery units will be constituted within 3 months of the NNBP 2020-2025 approval by the presidency comprising of:

i. Infrastructure
ii. Demand Drivers: Skills, Innovation and Enterprise
iii. Policy: Bringing multiple agencies together: NCC, NESREA, NRC, NIWA, FMW, CBN etc.

Delivery Unit Members will be staffed and serve at the discretion of the Honourable Minister for a period of up to 3 years and execute projects in their relevant thematic areas collaborating with other units as needed. Staffing will be by direct recruitment or secondment of subject matter experts and will be determined by the prioritization and timing of projects and scope of each initiative.

Each critical agency responsible for execution of the plan e.g. NCC, NITDA, NIGCOMSAT, USPF should also be required to designate a single point of contact or unit that will be accountable for co-ordinating all of its deliverables and interfacing with the delivery units.

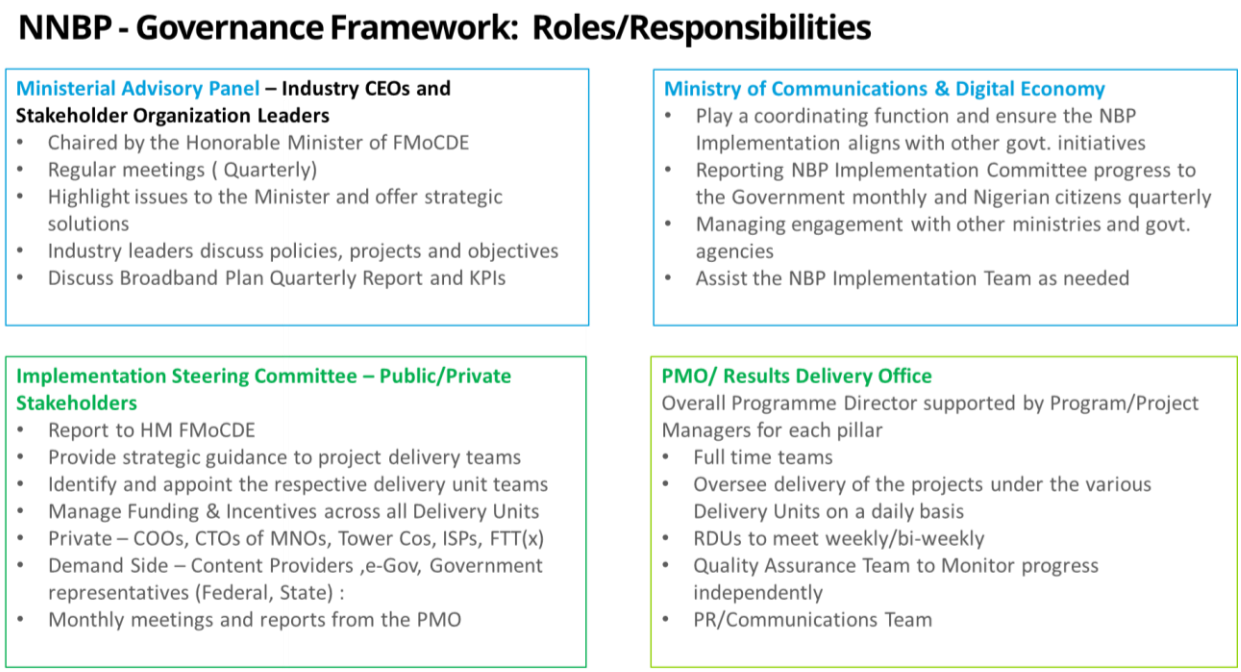


Figure 6.2: NNBP Governance Framework Roles/Responsibilities Summary

Sample Roles and Stakeholder Responsibilities:

Private sector

- Investments
- Regional and international finance agencies
- Infrastructure development
- Promotion of technology, awareness and technical literacy
- Possible financing of low cost devices
- PPP and innovative investment models

Local/State Governments

- Removing RoW and any regulatory / tax / financial barriers
- Advocating and measuring adoption/benefits of broadband
- Promoting metro networks and enabling implementation

Civil Society

- Raising awareness on broadband adoption
- Consumer rights agencies/organizations
- Capacity building with underserved groups

Local Communities

- Participating in ensuring security of broadband infrastructure
- Community advocacy and support

6.1 Project Reporting Framework

Timely and effective implementation of project activities will be critical to the success of the NNBP for each Delivery Unit. Standardized detailed progress reports including change and issue resolution tracking, as well KPI/result measurement will be provided by all delivery units to ensure harmonized progress tracking.

A database with a central integrated dashboard across the program will be accessible by all stakeholders on the Steering Committee, Project/Result Delivery Units and co-ordinating agencies.

- Weekly RDU updates will be prepared and provided to the PMO
- Monthly reports will be provided to the Steering Committee
- Quarterly Programme Progress Reports will be compiled and reviewed in depth at the Quarterly Steering Committee meetings
- Bi-annual audit reports which will be provided by the independent monitoring and reporting agency and then published to the public
- Annual stakeholder forums to garner feedback from implementation progress will hold
- Midterm reviews at end of Year 3 (2022), will hold on each of the key outcomes
- End of term review in Q1, 2025 will hold to review achievements, challenges, lessons learned and begin formulation of strategy for next 5 year term 2025 – 2030

6.2 Communication/PR

The PMO will be responsible for overall communications and public relations of the plan which will be required to engage the public. Such activities will include:

- Awareness of the NBP progress and digital literacy drive should be implemented including definitions and publishing of indices in the national papers, websites, popular content sites, radio, TV, video, all multimedia channels and forms including SMS, text and in the major local languages
- Events and PR promotions, endorsements, conferences to be promoted with help of industry to keep the National Broadband plan on the national agenda and ensure awareness and support of the public

Independent Monitoring and Evaluation Framework / Quality Assurance (QA)

An independent audit of progress towards plan delivery should be conducted and published every 6 months by an experienced QA team and these results reported to the Honorable Minister and the advisory council for consideration. Ideally this audit will be conducted by a third party agency such as a Big Four Consulting company or an organization such as A4AI that conducts ongoing industry research and is able to assess actual progress towards achievement of the plan, rather than simply rely on reports provided by the Delivery Units. Such audits should be conducted twice a year and should be conducted with sufficient depth to assess both amount and quality of progress being made.

Table 6.1 High Level Implementation Roadmap

The following implementation roadmap outlines the various recommendations and timelines for execution of the broadband plan. The plan recognizes the need for various policy initiatives and certain budget provisions to enable realization of certain elements. However, the overall plan is geared towards immediate execution where possible so the objectives can be speedily achieved, and benefits derived.

Table 6.1 High Level Implementation Roadmap

S/N	RECOMMENDATIONS / INITIATIVES		2020				2021				2022				2023				2024			
	INFRASTRUCTURE		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
1	IN-1	Develop CNI Database																				
	IN-2	Develop CNI Strategy																				
	IN-3	Facilitate Policy on CNI – Executive Order																				
	IN-4	Establish CNI Database of Federal MDAs RoW																				
	IN-5	Prepare National Broadband Protection Report																				
	IN-6	Broadband Infrastructure Stakeholder Summit																				
	IN-7	Establish Broadband Coordinating Unit - NCC																				
	IN-8	Open Access Consortium																				
	IN-9	Implement Open Access & Separation of Accounting																				
	IN-10	National Backbone – InfraCos																				
	IN-11	Metro and Last Mile Sharing & Building Codes																				
	IN-12	Internet Exchange : Upgrade & Localise Traffic																				
	IN-13	Submarine Cable Landing Resiliency																				
	IN-14	National Satellite Broadband Deployment																				
			2020				2021				2022				2023				2024			
2	**POLICY**		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
	P-1	Implement National Standardized RoW Fees - NEC/FEC																				
	P-2	Incentivize RoW with USPF/Social Funds - NEC/FEC																				
	P-3	Federal Infrastructure Asset Sharing Guidelines.																				
	P-4	Duct Network Development/Dig Once Policy																				
	P-5	Fixed Internet Services – FTTB Ducts Regulation																				
	P-6	Site Acquisition – One-stop Shop, Approvals																				
	P-7	Site Acquisition Permits Intervention: FCT and other major cities. (Aesthetics)																				
	P-8	Harmonize Process and Establish Uniform Framework for Tower Related Charges																				
	P-9	Accelerate Telecoms Equipment Import Clearance																				

			2020				2021				2022				2023				2024			
	P-10	Enhance regulation of Tower Cos.																				
	P-11	Local Device Assembly Policy																				
	P-12	Policy on Pre-Project feasibility and assessment studies.																				
	P-13	Establish Broadband Monitoring Committee.																				
	P-14	Introduce Broadband State Ranking Report.																				
			2020				2021				2022				2023				2024			
2.1	**POLICY – SPECTRUM**		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
	PS-1	Promote Efficient Use of assigned Spectrum																				
	PS-2	Active Infrastructure Sharing Framework																				
	PS-3	National Roaming Framework																				
	PS-4	Transparent Assignment of Spectrum																				
	PS-5	Review the Spectrum Trading Guidelines of 2018																				
	PS-6	Spectrum Pricing																				
	PS-7	Clear 700MHz and 2.6GHz band encumbrances																				
	PS-8	Deployment of Television White Space for broadband																				
	PS-9	Spectrum Planning for the future																				
			2020				2021				2022				2023				2024			
3	**DEMAND DRIVERS**		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
	D-1	Affordability – Incentivise low cost smart devices																				
	D-2	Expand Womens' Social Investment Scheme																				
	D-3	Implement Student Device Affordability Schemes																				
	D-4	Promote Local Hosting of Nigerian Websites & Content																				
	D-5	NIRA Free domain registration																				
	D-6	Digital Indigenous Language Content																				
	D-7	Digital Literacy Training and Awareness																				
	D-8	Digital indigenous language translation to Audio																				
	D-9	e-Government initiatives																				
	D-10	Deploy Community Access Centres																				
	D-11	Establish Consumer Awareness and Safety Initiatives																				
	D-12	e-Govt. Interoperability framework																				
			2020				2021				2022				2023				2024			
4	**FUNDING AND INCENTIVES**		Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4	Q 1	Q 2	Q 3	Q 4
	F-1	Funding of National & Regional Backbone Infrastructure.																				

	F-2	Harmonize the processes for issuance of RoW relevant permits.																				
	F-3	Increase subsidy/incentive on USPF Capex and Opex																				
	F-4	Incentivize local devices: OEM sub $25 smartphones and sub $40 tablets																				
	F-5	Funding skills building & Innovation																				
	F-6	Secure alignment of state and local governments on broadband penetration																				

Table 6.2 Strategic Mapping of Plan Outcomes to Recommended Initiatives

The table below is provided as a guide for mapping recommendations and actions contained within the plan to desired targets and outcomes. It will be important to monitor progress by the delivery units not solely on their tasks, but the realization of the targets set in the plan as shown below.

No.	Outcome	Pillar	Initiative Reference
1	**Coverage**	Infrastructure	IN6; IN7; IN8; IN9; IN10; IN14
		Policy	P1-P3; P6 - P10; P12; P14 PS1 - PS3; PS5; PS7, PS9
		Funding	F1; F2; F3; F6
2	**Speed**	Infrastructure	IN6-10; IN12; IN14
		Policy	P6; P8; P14 PS1; PS2; P9
3	**Penetration**	Infrastructure	IN6 - IN11; IN14
		Policy	P1-P3; P5 - P8; P10; P14 PS1; PS2; PS3; PS5; PS9
		Funding	F1; F2; F6
		Demand Drivers	D1-D4
4	**Fibre Reach**	Infrastructure	IN4; IN6 - IN11; IN14
		Policy	P1-P4; P8
		Demand Drivers	D1; D2; D3;D5
		Funding	F1; F2; F3;
5	**Affordability**	Infrastructure	IN7-IN9; IN11; IN14
		Policy	P1; P2; P4; P8; PS6;
		Demand Drivers	D1; D3; D4; D5
		Funding	F2 - F4;
6	**Digital Literacy**	Policy	P13
		Demand Drivers	D2; D5; D6 - D9; D11; D12
		Funding	F4; F5
7	**Gender Equality**	Policy	P13
		Demand Drivers	D1; D2; D3; D6; D7;
		Funding	F8
8	**Unserved Rural Communities**	Infrastructure	IN6; IN7; IN10; IN14
		Policy	P1; P2; P4; P12; PS1 – PS3; PS5; PS8
		Demand Drivers	D6; D9; D10 - D12
		Funding	F1 – F3; F5; F6

6.3 Funding

Funding for the implementation of the NNBP 2020-2025 is largely based on the realignment of existing private sector and government intervention funding budgets in line with the strategies required to achieve the plan's objectives. Specifically, private sector funding is to be mobilized and accelerated through the provision of incentives by Government to reduce the cost of deployment and ongoing operational expenses. Government spending through agencies such as USPF, NITDA, NCC, GBB, should be harmonized to reduce overlaps and ensure optimal results from the implementation of the broadband plan.

Government funding will be required for the establishment of the Program Management Office, Delivery Units, and the administration of the Broadband Implementation Steering Committee and the independent Monitoring and Evaluation/Quality Assurance teams. It is anticipated that the Honourable Minister will seek approval for this nominal incremental direct spending required to ensure successful implementation of the plan.

Major investment categories to achieve the plan include:

- National Fibre Backbone and Metro - $1-$1.5 Billion ($12,000 -$15,000/km at estimated 80,000km)
- 4G rollout (Deployment of new base stations and radio access equipment) - $1-2Billion (estimating $500 Million for estimated 2,500 new base stations, and additional investment for radio access and core network equipment)
- Optional 5G roll out for top 10 cities. Estimated at 6,000 base stations - $500 Million
- Subsidy/Local manufacture of devices – $100 Million estimated funding required (based on subsidy grant/credit scheme to 5 Million individuals in National Social Investment Programs receiving a device).

Table 6.3 Investment Incentives

Investment Categories	PUBLIC SECTOR	PRIVATE SECTOR
Fibre	RoW Standardised Fees World Bank "Moonshot" Funding for improved internet access	Infrastructure sharing
Base Stations	USPF Subsidy, Harmonized Tower Fees	Local manufacturing
BB Equipment/ End-user device assembly	Pioneer Status for local assembly Duty waivers for components	International and local funding
4G/5G Spectrum	Spectrum Pricing and Allocation	Spectrum sharing
Digital Demand	NITDA/USPF spending on E-Government programmes Social Investment Schemes Subsidy/Grants on Low cost Devices	Local Content and Hosting Literacy Training & Awareness

Total estimated incremental investment required for the delivery of the plan over the next 5 years across all categories is estimated at below $5 Billion. The resultant impact of this

investment based on the planned 30-40% increase in broadband penetration is estimated at up to 5% of GDP or approximately $25 Billion (World Bank Group).

In addition, broadband communications will be a major driver of social change and economic development. It will impact and transform all public and private sector endeavours across the country from security to health, education, manufacturing and retail, agriculture, entertainment, transportation and play a significant role towards the achievement of SDGs by 2025.

Table 6.4 Sample Execution Risks and Potential Mitigation Strategies

Execution Risk	Mitigation
Insufficient Funding (Private Sector)	Promote private sector buy in at all levels
Protection of investor rights when license obligations are fulfilled	Ensure investors are protected when obligations fulfilled and enforcement when not fulfilled. Consult/issue public notices in advance of issuing licenses to ensure matters arising are comprehensively dealt with before issuance
High Implementation Cost	Shared infrastructure, tax waivers, RoW fees at N145/m
Lack of Available Power	Increased power sector spending is required to support Broadband plan objectives
Poor quality implementation of projects	Appoint skilled, experienced professionals and vendors. Utilize international best practice PM methodology
Lack of coordination across 3 tiers of government	Broadband Steering Committee to engage representatives of various tiers and work to resolve issues
Seemingly conflicting models of licensing adopted for services in a low-income market	Regulator will need to continue to push models that best meet market needs which deliver value to investors and ensure delivery of critical services to citizens.
Undue interference of Government	Ministerial Advisory Panel to monitor pulse of industry and frequently engage Minister & Regulator
Inconsistent Policy	Ensure clarity and transparency of telecom regulations and government policies in line with Telecommunications Act
Industry and market domination by Significant Market Players only and high barriers to entry for smaller players resulting in a cartel.	• Avoid significant dominance by ensuring NCC enforcement of existing provisions in the Telecommunications Act • Ensure the separation of accounts and the elimination of cross-subsidy in the vertical market is implemented. • Involve FCCPC in ensuring fair competition and in assuring consumer protection against anti-competitive acts.
Insecurity/vandalization of infrastructure by criminals	CNI implementation to address these issues and check such actions with enforcement
Government construction projects damaging infrastructure	• Infrastructure better tracked and improved awareness and planning with CNI implementation. • Dig Once Policy and encourage use of ducts. • Independent auditing and reporting with penalties for damage.

6.4 Key Success Factors

Effective stakeholder management and implementation will be critical for the successful delivery of the National Broadband Plan. The Honourable Minister and his Advisory Panel will need to ensure the efforts in the following areas are sustained:

- Renewed political will and engagement
- Governance structure with authority and enforcement
- Alignment of private company investments to national plans
- Multidimensional approach and holistic view from demand and supply sides
- Innovative and comprehensive funding plan
- Rigorous tracking and penalties/escalation upon non-achievement of targets/quality standard.

7 APPENDICES

7.0 APPENDIX A: DEFINITIONS

Table 7.1 Key Definitions for NNBP 2020-2025 Plan

SN	ITEM	DEFINITION	METRICS FOR MEASUREMENT	SOURCE
1.	**Internet user**	• Someone currently using the Internet • Those who uses the Internet at least one hour per week. • Anyone currently in capacity to use the Internet • Individual with access to the Internet within a location	Number of users	• ITU • US Dept. of Commerce • CNNIC (China) • Internet World Statistics (IWS)
2.	**Internet Penetration**	• Percentage of Internet users relative to the total population in the last 30 days	% of total penetration	• International Telecommunication Union (ITU)
3.	**Internet Penetration Rate**	• Corresponds to the percentage of the total population of a given country or region that uses the Internet	% of total population = (Number of Users divided by Target Market Size) multiplied by 100	• ITU
4.	**Effective Penetration**	• Percentage of unique Internet users relative to the total population in the last 30 days	Unique % of total population	• ITU • OECD
5.	**Unserved**	• Locations that does not have any service provider coverage	% of total coverage	• NCC
6.	**Underserved**	• Locations with only 1 service provider coverage		• NCC
7.	**Internet Connectivity**	• Measure of the extent to which the internet (nodes) are connected, and the (speed) with which they can 'converse.'	Bandwidth in Mbps	• GSM Association (GSMA)
8.	**Internet Coverage**	• Total number of people with internet coverage as a percentage of total population	% of covered as a factor of total population	• GSMA
9.	**Effective coverage**	• Total number of unique people with internet coverage in the last 30 days as a percentage of total population	Unique connected as a % of total population	• ITU
10.	**Mobile Coverage**	• Receive signal strength of -95dBm at the edge of the cell radius of base transceiver station		• NCC
11.	**Effective users**	• Total number of unique Internet users in the last 30 days excluding M2M.	n/a	• GSMA • ITU
12.	**Broadband**	• Commonly refers to high-speed Internet connection	n/a	• GSMA

SN	ITEM	DEFINITION	METRICS FOR MEASUREMENT	SOURCE
13.	**Broadband penetration**	• The measured by the number of broadband subscribers per 100 inhabitants.	n/a	• France • Organisation for Economic Co-operation and Development (OECD)
14.	**Population**	• The number of people living in an area	n/a	• UN
15.	**Upload**	• The maximum amount of data your computer can send to the Internet in a second.	Mbps	• GSMA
16.	**Download**	• The maximum amount of data your computer can receive from the Internet in a second.	Mbps	• GSMA
17.	**Subscribers**	• Users who may have multiple devices and/or connections	n/a	• The World Bank
18.	**Unique subscribers**	• Unique users that subscribed to mobile services at the end of a period, excluding M2M.	n/a	• The World Bank
19.	**Mobile Internet services**	• Any activity that consumes mobile data (i.e. Excluding SMS, MMS and cellular voice calls)	n/a	• Statista
20.	**Unique mobile internet subscribers**	• Total unique users who have used internet services on their mobile device(s) at the end of a period.	n/a	• GSMA • ITU
21.	**Total mobile connections**	• Total unique SIM cards or phone numbers, excluding cellular IoT, that have been registered on the mobile network at the end of the period	n/a	• GSMA • ITU
22.	**Network coverage by population**	• Mobile coverage, expressed as a percentage of the total market population, at the end of the period	n/a	• GSMA
23.	**Growth**	• Connections at the end of the period, expressed as a percentage growth from the year before	n/a	• GSMA
24.	**Connection speed**	• The rate at which data is transferred between a device to the internet, (a measure of upload and download rate)	Bandwidth (Gigabits)	• M-Lab • Ookla
25.	**Internet speed test**	• The Process of analyzing broadband connection parameters (Upload/Download speed, Bandwidth, Ping, Jitter, Packet loss) by sending files from the source and measuring the time it takes to download and then upload the file back to the source	• Speed (Mbps) • Quality (QoS)	• Techopedia

SN	ITEM	DEFINITION	METRICS FOR MEASUREMENT	SOURCE
26.	**Internet drive test**	• The process of measuring and assessing the coverage, capacity, performance and Quality of Service (QoS) of a mobile network	n/a	• Speedtest.net
27.	**Connected**	• Refers to mobile internet penetration. Number of unique users who have used internet services on a mobile device	n/a	• World Bank
28.	**Usage gap**	• Those living within the footprint of a mobile broadband network but are not using mobile internet	n/a	• NCC • Huawei
29.	**Coverage gap**	• Those not living within the footprint of a mobile broadband network	n/a	• NCC • Huawei
30.	**Mobile broadband**	• Defined as connections on 3G, 4G and above	n/a	• FCC • ITU
31.	**Dig Once Policy**	• Co-ordinating infrastructure deployment to ensure synchronized digging “Dig Once” to install integrated infrastructure services: roadway, water, gas lines, and railways. Reduces cost, reduce risk of damage, increases rollout speed of broadband	n/a	• ncbroadband.gov

7.1 APPENDIX B: REFERENCES

7.1.1 UNDERSERVED AREAS

Table 7.1.1 USPF Table of Unserved Clusters

S/N	Cluster ID	State	Geopolitical Zone	Population	Area (Sq. Km)	Main Activity	Main Institutions
1	JG-1	Jigawa	NorthWest	474,208	2,945.39	Farming	Primary School, Secondary School
2	JG-2	Jigawa	NorthWest	461,724	2,623.43	Farming	Primary School
3	JG-3	Jigawa	NorthWest	463,752	3,887.12	Farming, Fishing, Marketing, Business,	Clinic
4	JG-4	Jigawa	NorthWest	218,551	1,561.08	Farming, Trading, Cattle Rearing	Primary School
5	JG-5	Jigawa	NorthWest	336,305	1,938.05	Farming, Cattle Rearing,	Primary school, Almajiri School, Secondary School, Islamiyah School,
6	KB-1	Kebbi	NorthWest	327,193	5,363.82	Farming, Cattle Rearing,	Primary School
7	KB-2	Kebbi	NorthWest	284,297	4,120.25	Farming	Primary School
8	KB-3	Kebbi	NorthWest	186,976	2,790.68	Farming, Trading	Primary School, Secondary School
9	KB-4	Kebbi	NorthWest	418,514	6,843.82	Farming	Primary School, Secondary School
10	KB-5	Kebbi	NorthWest	123,919	2,530.71	Farming	Primary School, Secondary School
11	KB-6	Kebbi	NorthWest	298,732	5,550.87	Farming	Primary School, Secondary School
12	KD-1	Kaduna	NorthWest	390,930	3,551.88	Farming	Primary School, Secondary School
13	KD-2	Kaduna	NorthWest	209,904	4,881.49	Farming	Primary School, Secondary School
14	KD-3	Kaduna	NorthWest	503,784	3,845.68	Farming	Primary School, Secondary School
15	KD-4	Kaduna	NorthWest	45,003	3,000.21	Farming	Primary School, Secondary School
16	KD-5	Kaduna	NorthWest	354,179	8,049.51	Farming	Primary School, Secondary School
17	KD-6	Kaduna	NorthWest	368,507	6,041.10	Farming	Primary School, Secondary School
18	KN-1	Kano	NorthWest	802,667	2,659.59	Farming, Cattle Rearing,	Secondary School, Primary School
19	KN-2	Jigawa	NorthWest	438,302	1,522.47	Farming, Cattle Rearing	Primary School, Secondary School
20	KN-3	Kano	NorthWest	536,809	3,127.47	Farming	Primary and Secondary school
21	KT-1	Katsina	NorthWest	490,335	3,081.49	Farming	Primary School, community day Secondary School, Secondary School, Islamiyya School
22	KT-2	Katsina	NorthWest	589,427	2,395.74	Farming	Primary School, Secondary School, Islamiyya School
23	KT-3	Katsina	NorthWest	537,053	4,163.20	Farming	Primary School, Secondary School, Islamiyya School

24	KT-4	Katsina	NorthWest	503,574	2,247.60	Farming	Almajiri School, Primary School, Secondary School, School for Vocational Agriculture
25	SK-1	Sokoto	NorthWest	411,122	7,474.94	Farming	Primary School, Secondary School
26	SK-2	Sokoto	NorthWest	590,586	5,262.53	Farming	Primary School, Secondary School
27	SK-3	Sokoto	NorthWest	310,382	4,876.90	Farming	Primary School, Secondary School
28	SK-4	Sokoto	NorthWest	338,900	3,987.06	Farming, Cattle Rearing	Primary School, Secondary School
29	SK-5	Sokoto	NorthWest	180,890	3,349.81	Farming, Trading	Primary School, Secondary School
30	ZM-1	Zamfara	NorthWest	338,325	5,151.10	Marketing, Cattle Rearing, Farming	Primary School, Secondary School
31	ZM-2	Zamfara	NorthWest	630,975	13,716.84	Farming, Cattle Rearing	Primary School, Secondary School
32	ZM-3	Zamfara	NorthWest	658,737	4,843.65	Marketing, Cattle Rearing, Farming	Primary School, Secondary School
33	ZM-4	Zamfara	NorthWest	404,727	3,679.34	Farming	Primary School, Secondary School
34	AD-1	Adamawa	North East	412,120	4,737.01	Farming, Trading	School, Hospital
35	AD-2	Adamawa	North East	152,955	3,186.57	Farming	None
36	AD-3	Adamawa	North East	377,914	5,904.90	Farming, Trading	School, Hospital
37	AD-4	Adamawa	North East	313,324	5,310.58	Farming	Primary and Secondary school, Hospital
38	AD-5	Adamawa	North East	110,304	2,565.21	Farming, Trading	Primary School, Hospital
39	AD-6	Adamawa	North East	64,374	6,226.66	Farming, Cattle breeding	Primary and Secondary School, Hospital
40	BC-1	Bauchi	North East	386,168	3,510.62	Farming	Primary & Secondary school, Dispensary
41	BC-2	Bauchi	North East	764,354	5,382.77	Farming, Petty-trade	Primary health care, Primary & Secondary schools, Dispensary
42	BC-3	Bauchi	North East	392,709	6,233.48	Farming, Petty-trade	Primary health care, Primary & Secondary school
43	BC-4	Bauchi	North East	465,228	10,113.70	Farming, Petty-trade	Primary health care, Primary & Secondary school
44	BC-5	Bauchi	North East	622,369	9,878.88	Farming, Livestock farming	None
45	BO-1	Borno	North East	440,534	14,210.80	Farming, Trading	Clinic, Primary & Secondary Schools, Fish, Sugar Cane Mkt
46	BO-2	Borno	North East	191,758	5,326.60	Farming	Central Primary School, Primary health care
47	BO-3	Borno	North East	382,742	9,813.89	Farming	Primary & Secondary schools, Primary health centre
48	BO-4	Borno	North East	495,573	9,717.11	Farming	Clinic, Primary & Secondary School, Monday & Daily Markets
49	BO-5	Borno	North East	377,828	11,112.60	Farming, Petty-trading	Special Hospital for disabled children, Primary School, Primary Health Centre, General Hospital
50	BO-6	Borno	North East	106,606	7,107.08	Animal Rearing	Clinic, Primary & Secondary Schools, Quranic School, Daily Market

51	BO-7	Borno	North East	254,260	4,622.91	Farming	Market, Primary and Secondary Schools, Police Post
52	GO-1	Gombe	North East	382,923	4,973.02	Farming, Livestock farming	Primary school
53	GO-2	Gombe	North East	71,729	1,698.46	Farming, Petty-trading	Primary school, Primary health care
54	GO-3	Gombe	North East	135,739	2,163.10	Farming	2 Primary health centres, Primary & Secondary school
55	GO-4	Gombe	North East	252,743	2,197.76	Farming, Trading	Primary & Secondary schools, Primary health centres
56	TR-1	Taraba	North East	149,658	5,986.31	Farming , Petty-trading	Government Primary & Secondary School, Dispensary
57	TR-2	Taraba	North East	151,296	6,578.09	Farming, Petty-trading	Primary school, Maternity Clinic
58	TR-3	Taraba	North East	195,535	7,821.38	Farming, Trading	Primary & Secondary schools, Health Care Centre
59	TR-4	Taraba	North East	230,984	8,883.99	Farming, Petty-trading	Primary school, Healthcare centre
60	TR-5	Taraba	North East	239,161	11,958.10	Farming, Trading, Logging	Primary Healthcare, CSDP, Primary & Secondary school, Mambila coffee research Institute
61	TR-6	Taraba	North East	133,822	5,147.01	Farming & Trading	Primary Healthcare, Primary & Secondary schools
62	YB-1	Yobe	North East	375,920	9,892.64	Farming	Primary health care, Primary schools, Universal Basic Education
63	YB-2	Yobe	North East	706,546	11,039.80	Farming, Trading	Primary & Secondary school, General hospital, Government Primary and secondary school
64	YB-3	Yobe	North East	183,802	8,752.48	Farming and Trading	Clinic, Primary and Secondary Schools, Daily Mkt
65	YB-4	Yobe	North East	203,740	3,512.75	Farming, Cattle rearing, Petty-trading	Nigerian-Army Special Forces training school, Primary health care, Primary & Secondary schools, Dispensary.
66	YB-5	Yobe	North East	177,467	4,328.47	Dispensary, Primary & Secondary schools, Primary health care	Beniseeds, Guinea-Corn, Millet
67	EK-1	Ekiti	South West	13,000	458.25	Farming (Cocoa, Oil Palm)	Primary Schools/Health Centres
68	LA-1	Lagos	South West	992	243.56	Farming, Fishing	Palace of Kabiesi Oriba Land, Oriba Primary, Junior Secondary and Senior Secondary School
69	OD-1	Ondo	South West	69,808	2,573.42	Logging	Primary School, Health Centre
70	OD-2	Ondo	South West	72,315	1,648.07	Logging	Primary and Secondary Schools, Health Centre
71	OG-1	Ogun	South West	30,187	1,677.31	Logging	Primary and Secondary Schools, Health Centre
72	OG-2	Ogun	South West	60,213	2,964.12	Farming	Primary School, Federal Polytechnic, Ilaro
73	OS-1	Osun	South West	45,926	1,131.74	Logging	Primary, Secondary Schools, Health Centres
74	OY-1	Oyo	South West	223,611	7,453.71	Farming	Primary, Secondary Schools, Health Centres
75	OY-2	Oyo	South West	152,787	5,268.52	Farming	Primary Schools, Health Centres

76	OY-3	Oyo	South West	90,267	3,761.12	Farming	Primary Schools, Health Centres
77	AK-1	Akwa Ibom	South South	12,561	259.63	Farming, Fishing, Petty-trading	Secondary/ River/ Untarred
78	BY-1	Bayelsa	South South	114,148	3,774.93	Farming, Fish Farming, Petty-trading, Plantation farming	River
79	CR-1	Cross River	South South	185,054	6,393.85	Farming, Petty-trading, Boat transportation	Tarred/ Untarred/ Footpath
80	CR-2	Cross River	South South	203,279	4,413.44	Fish-farming, Farming, Petty-trading	
81	DE-1	Delta	South South	145,057	4,798.67	Farming, Fishing	Tarred/ Untarred/No Road
82	ED-1	Edo	South South	78,264	3,074.96	Fish farming, Farming, Petty-trading	Tarred/ Untarred
83	ED-2	Edo	South South	62,445	3,103.78	Lumbering, Farming, Petty-trading	Secondary/Tarred/ Untarred
84	RV-1	Rivers	South South	123,815	2,073.23	Fishing, Farming, Petty-trading	Secondary/ River
85	BN-1	Benue	North Central	339,695	4,365.19	Farming	Schools, Primary Health Centres
86	BN-2	Benue	North Central	502,024	6,538.15	Farming	Schools, Churches, Primary health care
87	BN-3	Benue	North Central	585,726	4,893.07	Farming	Primary healthcare, Schools
88	FC-1	FCT, Abuja	North Central	110,458	1,534.14	Farming	Primary health care
89	FC-2	FCT, Abuja	North Central	80,819	1,816.24	Farming, Livestock farming	Health centres, Market, Junior Secondary School
90	KG-1	Kogi	North Central	102,988	7,787.69	Farming	Schools, Health Centres.
91	KG-2	Kogi	North Central	130,500	3,260.45	Farming	Schools, Primary health care
92	KG-3	Kogi	North Central	168,776	3,364.50	Farming	Schools & Primary health centre
93	KW-1	Kogi	North Central	122,443	9,365.03	Farming	Schools, Primary Health Centres
94	KW-2	Kogi	North Central	104,861	7,490.06	Farming	Schools, Primary Health care
95	KW-3	Kwara	North Central	204,981	6,943.25	Farming	General hospital, Schools, Primary Health Care
96	NA-1	Nassarawa	North Central	171,954	6,888.07	Farming	Primary Health Centres, Schools
97	NA-2	Nassarawa	North Central	298,256	4,543.19	Farming	Markets & Primary health centre
98	NA-3	Nassarawa	North Central	221,818	5,403.67	Farming	General Medical Centre, Schools
99	NG-1	Niger	North Central	208,342	4,845.17	Farming	Schools
100	NG-2	Niger	North Central	289,019	8,257.68	Farming	Primary health care, Police Station
101	NG-3	Niger	North Central	345,673	7,856.18	Farming	Schools
102	NG-4	Niger	North Central	291,410	8,570.89	Farming	Schools, Primary Health Centres

103	NG-5	Niger	North Central	360,495	10,013.74	Farming	School
104	NG-6	Niger	North Central	97,658	8,138.14	Farming	Primary health centres, Schools
105	NG-7	Niger	North Central	111,963	5,892.80	Farming	Primary health centre, Schools
106	PL-1	Plateau	North Central	402,943	3,145.99	Farming	Primary health centre, Schools
107	PL-2	Plateau	North Central	313,632	4,620.37	Farming	Primary health centre, Schools
108	PL-3	Plateau	North Central	299,103	4,228.26	Farming	Primary health centre, Schools
109	PL-4	Plateau	North Central	159,344	5,494.61	Farming	Primary health centre, Schools
110	AB-1	Abia	South East	14,970	97.65	Farming	
111	AN-1	Anambra	South East	55,904	721.08	Farming/Fishing	Primary & Secondary Schools, Primary Health Care
112	EB-1	Ebonyi	South East	166,983	833.64	Farming and Fishing	Health Centre, Primary School
113	EN-1	Enugu	South East	77,405	883.42	Farming	Pry Sch, Ch, Maternity Centre, Sec Sch, Clinic
114	IM-1	Imo	South East	2,428	213.75	Family	
			Total	**31,157,774**	**564,037.90**		

7.2 APPENDIX C: PILLARS

7.2.1 INFRASTRUCTURE NOTES

Documents Referenced:

1. CyberCrime__Prohibition_Prevention_etc__Act__2015
2. FTTH Handbook_2017_V8_FINAL.
3. Framework for the Development of National Integrated Infrastructure Master Plan (Dr. Shamsudeen Usman).
4. National-Integrated-Infrastructure-Master-Plan (Ministry of National Planning).
5. National broadband Plan (2013 – 2018).
6. Terms of Reference (ToR) for the Infrastructure Sub-Committee.
7. Making the Second Nigerian National Broadband Plan More Realistic (ATCON).
8. Presentation to Presidential Committee on National Broadband Plan 2020 –2025 (Paradigm Initiative).
9. Review of Nigeria Broadband Plan 2013-2019: Status of targets and proposed updates for consideration in the 2020-2025 plan (A4AI).
10. The Importance of Digital Identity Development in Nigeria (NIMC).
11. Laying and Crossing of Optical Fibre Cables on Waterways and its Rights (NIWA)
12. NNPC Broadband Journey (NNPC).
13. NRC Input on the National Broadband Plan (2020 – 2025) (NRC).
14. Measures in Providing access and Services in Very difficult to reach Areas
15. National Broadband Plan_Presentation by Infrastructure Sub-Committee.
16. Report of Right of Way Dispute Resolution by FEC between Works Ministry and NIWA.
17. RoW Proposal (Sidi Dennis).
18. Securing Broadband Infrastructure in Nigeria

7.2.1.1 Criminal Justice Miscellaneous Provisions Act – Extract

CRIMINAL JUSTICE (MISCELLANEOUS PROVISIONS) ACT
ARRANGEMENT OF SECTIONS

SECTION

1. Damage to telecommunication works an offence.
2. Damage to electricity lines, etc., an offence.
3. Damage, etc., to oil pipelines an offence.
4. Ascertainment of damage under this Act.
5. Punishment for parties to offences under this Act.
6. Power to arrest without warrant.
7. Trials and prosecution of offences.
8. Repeals.
9. Interpretation.
10. Short title.

SCHEDULE
Enactments repealed
CRIMINAL JUSTICE (MISCELLANEOUS PROVISIONS) ACT

An Act to provide stiffer penalties for damages to telephone communication works, electricity transmission lines and oil pipelines and to enable armed patrols arrest any person committing an offence under this Act.
[Commencement.] [16th October, 1975]

1. Damage to telecommunication works an offence
(1) Any person who willfully and unlawfully-
   (a) destroys, damages or removes any telecommunication works; or
   (b) otherwise prevents or obstructs the sending or delivering of a communication by means of telecommunication, shall be guilty of an offence under this Act.
(2) Any person found guilty of an offence under subsection (1) of this section shall, on conviction be liable-
   (a) in the case of an offence under paragraph (a) of subsection (1), to a fine of two times the value of any such telecommunication works as might have been destroyed, damaged or removed by him or N2,000, whichever is higher, or to imprisonment for ten years or to both such fine and imprisonment; or
   (b) in the case of an offence under paragraph (b) of subsection (1), to a fine of N500 or to imprisonment for three years or to both such fine and imprisonment.

2. Damage to electricity lines, etc., an offence
   (1) Any person who willfully and unlawfully-
      (a) destroys, damages or removes any electricity lines; or
      (b) destroys or damages any main transmission line or removes anything connected therewith; or
      (c) otherwise prevents or obstructs the transmission of electricity through any electricity or main transmission line, shall be guilty of an offence under this Act.
   (2) Any person found guilty of an offence under subsection (1) of this section shall, on conviction be liable-
      (a) in the case of an offence under paragraphs (a) and (b) of subsection (1), to a fine of two times the value of any such electricity line or any main transmission line or part thereof as might have been destroyed, damaged or removed by him or N2, 000, whichever is higher, or to imprisonment for ten years or to both such fine and imprisonment; or
      (b) in the case of an offence under paragraph (c) of subsection (1), to a fine of N500 or to imprisonment for three years or to both such fine and imprisonment.

3. Damage, etc., to oil pipelines an offence
   (1) Any person who willfully and unlawfully-
      (a) destroys, damages or removes any oil pipelines or installation connected therewith; or
      (b) otherwise prevents or obstructs the flow of oil along any such oil pipelines or interferes with any installation connected therewith, shall be guilty of an offence under this Act.
   (2) Any person found guilty of an offence under subsection (1) of this section shall, on conviction be liable-
      (a) in the case of an offence under paragraph (a) of subsection (1), to a fine of two times the value of any such oil pipeline or installation as might have been destroyed, damaged or removed, or of any oil that might have escaped as a result of such destruction, damage or removal N2, 000, whichever is higher, or to imprisonment for ten years or to both such fine and imprisonment; or
      (b) in the case of an offence under paragraph (b) of subsection (1), to a fine of N500, or imprisonment for three years or to both such fine and imprisonment.

4. Ascertainment of damage under this Act

For the purposes of this Act, the certificate of any of the following persons shall be conclusive evidence as to any sum to be ascertained pursuant to the relevant provision hereinafter mentioned, that is to say

(a) in the case of section 1 (2) (a) of this Act, of the Director of Telecommunications;
(b) in the case of section 2 (2) (a) and (b) of this Act, of the General Manager of the National Electric Power Authority; and
(c) in the case of section 3 (2) (a) of this Act, of the Director of Petroleum Resources.

5. Punishment for parties to offences under this Act

Any person who-

(a) aides, counsel, abets or procures any person to commit an offence under section 1,2 or 3 of this Act; or
(b) conspires with any person to commit an offence under section 1, 2 or 3 of this Act,

whether or not he is present when the offence is committed, shall be deemed to be guilty of the offence as a principal offender and shall be liable to be proceeded against and punished accordingly under this Act.

6. Power to arrest without warrant

(1) An armed patrol may arrest, without warrant, any person reasonably suspected of having committed or of being about to commit an offence under this Act, and an armed patrol may use minimum force to effect the arrest of that person or to prevent his escape.
(2) The foregoing provisions of this section shall have effect-
    (a) without prejudice to any other power conferred by any law on members of the Nigeria Police Force or members of the Armed Forces of the Federation; and
    (b) notwithstanding anything to the contrary in any law.

7. Trials and prosecution of offences

(1) Offences under this Act shall be triable summarily by the appropriate High Court and the provisions of Chapter 4 of the Criminal Procedure Act or, where applicable, Chapter 18 of the Criminal Procedure Code Law, shall apply accordingly.

[Cap. C41.]

(2) The prosecution of offences under this Act shall be at the instance of the Attorney-General of the Federation.

8. Repeals

The provisions of the enactments specified in the Schedule to this Act and in so far as those provisions are in force anywhere in Nigeria, are hereby repealed to the extent specified in that Schedule, and all other enactments to the like effect are similarly repealed.

9. Interpretation

In this Act, unless the context otherwise requires-

"Armed patrol" means any patrol comprising either both armed members of the Nigeria Police Force and armed members of the Armed Forces of the Federation or only armed members of the Nigeria Police Force or of the Armed Forces;

"Electricity line" and "main transmission line" have the meanings assigned thereto in section 44 (2) of the National Electric Power Authority Act;

[Cap. N33.]

"Oil" means crude oil within the meaning of the Petroleum Act and any refined products thereto;

"Oil pipeline" has the meaning assigned thereto by section 11 (2) of the Oil Pipelines Act;

[Cap. 07.]

"Telecommunication works" means a wire or wires used for the purpose of telegraph or telephone communications, with any casing, coating, tube, pipe, insulator or post enclosing or supporting the same or any apparatus connected therewith, and includes-

(a) any apparatus for transmitting messages or other matters, including television, by means of electric signals either by overhead lines or underground cable or cables lying under water; and

(b) any apparatus for transmitting messages with or without wires.

10. Short title

This Act may be cited as the Criminal Justice (Miscellaneous Provisions) Act.

SCHEDULE

[Section 8.]

Enactments repealed

Title	Chapter	Extent of Repeal
Criminal Code Act	Cap. C38	Section 84 and 185
Oil Pipelines Act	Cap. O7	Section 24(2)
Penal Code	Cap. 89 Laws of Northern Nigeria 1963	Section 467

CRIMINAL JUSTICE (MISCELLANEOUS PROVISIONS) ACT

SUBSIDIARY LEGISLATION

No Subsidiary Legislation

7.2.1.2 Cyber Crime Act 2015 – Extract

https://www.cert.gov.ng/ngcert/resources/CyberCrime__Prohibition_Prevention_etc__Act__2015.pdf

A Bill

For

An act to provide for the prohibition, prevention, detection, response, investigation and prosecution of cybercrimes; and for other related matters, 2015.

{ Commencement.

}

ENACTED by the National Assembly of the Federal Republic of Nigeria as follows:

PART I - OBJECT AND APPLICATION

1. The objectives of this Act are to – Objectives.

(a) provide an effective and unified legal, regulatory and institutional framework for the prohibition, prevention, detection, prosecution and punishment of cybercrimes in Nigeria;

(b) ensure the protection of critical national information infrastructure; and

(c) promote cyber security and the protection of computer systems and networks, electronic communications, data and computer programs, intellectual property and privacy rights.

2. The provisions of this Act shall apply throughout the Federal Republic of Nigeria. Application.

PART II - PROTECTION OF CRITICAL NATIONAL INFORMATION INFRASTRUCTURE

3. (1) The President may on the recommendation of the National Security Adviser, by Order published in the Federal Gazette, designate certain computer systems, and/or networks, whether physical or virtual, and/or the computer programs, computer data and/or traffic data vital to this country that the incapacity or destruction of or interference with such system and assets would have a debilitating impact on security, national or economic security, national public health and safety, or any combination of those matters as constituting Critical National Information Infrastructure. Designation of certain computer systems or networks as critical national information infrastructure.

(2) The Presidential Order made under subsection (1) of this section may prescribe minimum standards, guidelines, rules or procedure in respect of -

(a) the protection or preservation of critical information infrastructure;

(b) the general management of critical information infrastructure;

(c) access to, transfer and control of data in any critical information infrastructure;

(d) infrastructural or procedural rules and requirements for securing the integrity and authenticity of data or information contained in any designated critical national information infrastructure;

(e) the storage or archiving of data or information designated as critical national information infrastructure;

(f) recovery plans in the event of disaster, breach or loss of the critical national information infrastructure or any part of it; and

(g) any other matter required for the adequate protection, management and control of data and other resources in any critical national information infrastructure.

4. The Presidential Order made under section 3 of this Act may require the Office of the National Security Adviser to audit and inspect any Critical National Information Infrastructure at any time to ensure compliance with the provisions of this Act.

Audit and Inspection of critical national information infrastructure.

PART III - OFFENCES AND PENALTIES

5. (1) Any person who with intent, commits any offence punishable under this Act against any critical national information infrastructure, designated pursuant to section 3 of this Act, shall be liable on conviction to imprisonment for a term of not more than 10 years without an option of fine.

Offences against critical national information infrastructure.

(2) Where the offence committed under subsection (1) of this section results in grievous bodily harm to any person, the offender shall be liable on conviction to imprisonment for a term of not more than 15 years without option of fine.

(3) Where the offence committed under subsection (1) of this section results in the death of person(s), the offender shall be liable on conviction to life imprisonment.

6. (1) Any person, who without authorization, intentionally accesses in whole or in part, a computer system or network for fraudulent purposes and obtain data that are vital to national security, commits an offence and shall be liable on conviction to imprisonment for a term of not more than 5 years or to a fine of not more than ₦5,000,000.00 or to both fine and imprisonment.

Unlawful access to a computer.

(2) Where the offence provided in subsection (1) of this section is committed with the intent of obtaining computer data, securing access to any program, commercial or industrial secrets or classified information, the punishment shall be imprisonment for a term of not more than 7 years or a fine of not more than ₦7, 000,000.00 or to both such fine and imprisonment.

(3) Any person who, with the intent to commit an offence under this section, uses any device to avoid detection or otherwise prevent identification or attribution with the act or omission, commits an offence and shall be liable on conviction to

7.2.1.3

IXPN is now localizing 50% of the traffic for most of the connect service providers, the growth in local traffic is mostly attributed to the connection of some global content providers, such as Google, Facebook, and Microsoft. To reach the 80% target of localization for internet traffic by the year 2025, government must promote local hosting of all Nigerian digital content/websites and at the same time creating an enabling environment for data centres to thrive.

7.2.2 POLICY/SPECTRUM NOTES

NOTES ON SPECTRUM POLICY:

Transparency in the regulatory processes that award and regulate the utilization of spectrum, with a special focus on promoting healthy beneficial competition, is seen critical towards encouraging improvement in investor confidence in the Nigerian telecoms market.

Fair and Competitive Access to Spectrum: 'High Demand Spectrum' refers to spectrum that is insufficient to accommodate demand by operators. Currently in Nigeria, given the primary dependence on wireless spectrum for broadband, demand is high in the spectrum bands highlighted in Fig 7.1.1 below.

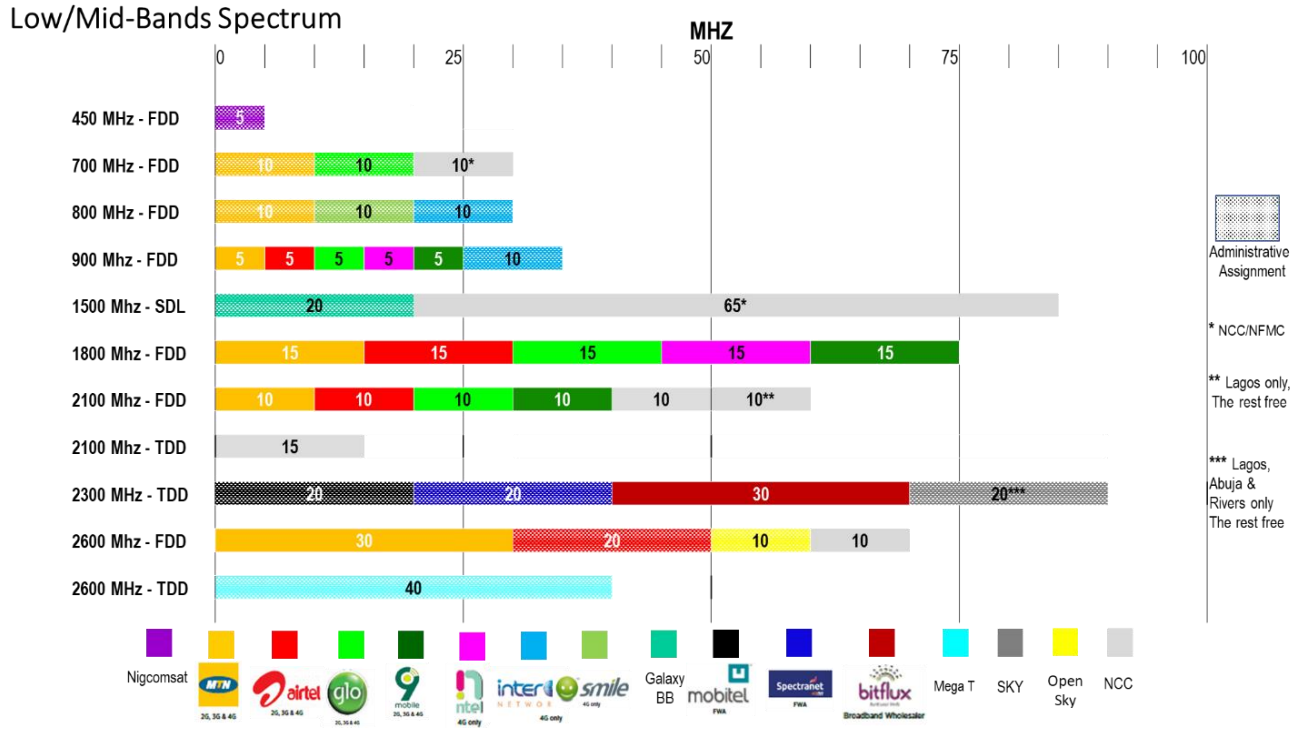


Figure 7.1.1: Assignment of High Demand Spectrum in Nigeria 2020 Source: NCC

As a limited resource, spectrum, each band with its inherent propagation characteristics, is limited and of high economic value. As such, the process of awarding and regulating spectrum should be geared towards efficient use in order to achieve the set short and long-term objectives of broadband targets for connectivity and access.

The Radio Frequency Spectrum

Spectrum is the life blood of everything that is mobile. Beyond mobile broadband, several other sectors engaged in wireless activities and or providing wireless services also covet the increasingly scarce spectrum -- from broadcasters and satellite service providers to those engaged in astronomy and science, from those engaged in serving maritime traffic to those providing navigation and global positioning services, not to mention state actors engaged in law enforcement, national defense and in providing PPDR (Public Protection and Disaster Relief) services. And, as mobile and wireless services gain increasing salience in society, the fight over spectrum among various public and private sector players is likely to intensify.

The challenge for regulators and policymakers engaged in the articulation and implementation of the National Digital Broadband Plan with respect to spectrum is to, first, balance the needs of the state versus the needs of the society, and then, in the social realm, balance the needs of various sectors seeking to utilize spectrum to offer useful services. Since different market sectors fall within the purview of different regulatory agencies – mobile broadband and broadcasting, for instance – the struggle between market actors often also translates into struggle between state agencies regulating them.

Value of the radio frequency spectrum

Radio spectrum is a national resource of considerable value. Radio spectrum use can be assumed to contribute between billions of USD to gross national product every year- either directly, as in spectrum auctions and licensing fees, or indirectly through taxes on commercial activity its usage supports. It is therefore important that the spectrum resource is utilized to create maximum socio-economic benefit for society and help achieve socio-political goals, such as inclusion of the marginalized groups.

Since even a minor increase in efficiency in the use of the radio frequency spectrum can contribute positively to economic growth and also meet political objectives of the society, it is important that the National Digital Broadband Plan consider a judicious allocation of spectrum in a manner that provides the greatest benefit to society.

Spectrum Management

Regulatory rules and conditions in the regime need to be clear, non-discriminatory and easily manageable. They need to enhance competition between sectors and market players in a manner that invites investments that can help society reap the benefits of digitalization underway and support the development of new mobile technologies and platforms – such as 5G – that can address social challenges in an effective manner.

Of course, the increasing ability of new technologies to reduce diverse information types – images and text, numbers and sounds into a single bit stream transmitted on a shared digital pathway and the concurrent convergence of information processing and telecommunications around a common digital language (aka digitalization) has blurred erstwhile clear sectoral boundaries – for instance, between telecoms and broadcasting. This has made the task of policymaker and regulators more complex, and the plan must seek to find a meaningful solution to this challenge. After all, any doctrine of fairness would demand that similar services should be subject to the similar costs and regulatory conditions.

In contrast, there are services that may be similar in nature – communications, for instance – that may legitimately be managed under somewhat different regulatory conditions owing to the nature of the service they provide. Consider communication services pertaining to public safety and national security,

that may well be deemed privileged. But even here, a modernized spectrum regime should seek to develop rules and regulation that are flexible enough to deal with emerging technology trends that may soon erase any meaningful difference in the robustness of commercial public networks and special use PPDR networks. Of course, some services, like defense communication services, will probably continue to remain separate, mainly because of specific needs of confidentiality, redundancy, resilience and security.

The current competition deployment model is also normally not providing rural coverage expansion at a speed that Government wants to see in the future when 5G is being deployed. Connectivity in underserved remote areas is important to national policies facing opinions of consumers, to service providers for reasons of public acceptance, and to satisfy the regulatory conditions in Nigeria.

When expanding coverage in remote areas under current circumstances, it may imply an undesirable local monopoly, suggesting that only one service provider would find grounds to expand in to such a remote area due to a low consumer base to sustain commercial opportunities. Notwithstanding that rural coverage might in the future be driven by the need for national security and public safety connectivity, internet of things, industry and consumer need for home broadband services as an alternative to fibre connections, is regarded to be a matter of urgency to identify viable solutions for all mobile and home broadband networks and services. So, effective planning needs to be undertaken to ensure that spectrum is utilized to support the country's socio-economic objectives.

Therefore there is a need to plan and release for deployment of the 3.5GHz band. This will offer an opportunity for sub-1GHz spectrum to be aggregated with 3.5 GHz for use to cover large areas to provide FWA that will evolve to 5G.

Transparency in the regulatory processes that award and regulate the utilization of spectrum, with a special focus on promoting healthy beneficial competition, is seen critical towards encouraging improvement in investor confidence in the Nigerian telecoms market.

Fair and Competitive Access to Spectrum:

'High Demand Spectrum' refers to spectrum that is insufficient to accommodate demand. Currently in Nigeria, given the primary dependence on wireless spectrum for broadband, demand is high in the spectrum bands shown in Fig 7.1.1 above.

In reviewing the spectrum chart of Fig. 7.1.1 above, it has been observed that from 2009 to date, only two (2) out of the seventeen licensed slots i.e. a 30Mhz TDD slot in the 2.3 GHz band won by Bitflux for open access wholesale services, and the other a FDD slot in the 2.6Ghz band won by MTN for WLL service, have been sold through a competitive process, but even at that, through an inefficiently designed auction.

In order to improve the situation for both government and citizens going forward, the process of awarding and regulating spectrum should henceforth be geared towards efficient use in order to achieve the set short and long-term objectives of broadband targets for connectivity and access. Furthermore it is herein recommended that the "Use it or Lose it" policy be vigorously enforced and appropriate modifications to the guidelines be carried out to make this effective.

7.2.3 Demand Drivers notes

Government to incentivize local assembly of smart phones with pioneer status and other viable waivers of duties, taxes and levies for them to assemble smartphones locally. This will create local jobs for the Nigerian youth. Also, imposing high taxes and duties on any smart phone imported into the country, will help to protect OEMs that are assembling Smartphones locally.

Government intervention towards smart device would drive the required volume of sales for the local manufacturers, hence making it a successful venture. It is equally anticipated that such devices would give Nigeria source of additional source of revenue through exports to neighboring countries.

With 62% literacy level in Nigerian, a sizable part of the population cannot go online due to lack of education or language barriers. Consequently, it is imperative for government to encourage creation of educational/vocational digital content in local languages.

NITDA, NCC and USPF to collaborate in siting of community centers to reduce duplication and to ensure sustainability of the project.

7.2.4 Funding & Incentives notes

Documents Referenced:

1. National Broadband Plan 2013-2018
2. WORLD BANK_Nigeria Broadband Infrastructure - Innovative Business Models Presentation: Presented at the NBP Committee Meeting
3. Deloitte, FICCI, Ministry of Communications of India (2016). *Broadband Infrastructure for Transforming India*. [online] India, pp.23-30. Available at: https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-broadband-infrastructure-for-transforming-india-noexp.pdf.
4. A new partnership model promises mobile broadband for rural populations, *DEVEX WORLD 2020,* 27 February 2019.
5. https://www.oecd.org/ict/4d/43631862.pdf
6. https://crtc.gc.ca/eng/internet/fnds.htm

The Committee reviewed and benchmarked Mozambique for last mile connectivity.

NATIONAL BACKBONE AND LAST MILE

Mozambique:
Underserved areas were determined and divided into clusters. Interested bidders were invited to build, operate and manage for at least a 10-year period. The selected project is fully funded by the universal service funds.

7.3 APPENDIX D: STAKEHOLDERS PROVIDING INPUT TO COMMITTEE

The National Broadband Committee thanks the organizations below which provided valuable input or made presentations to the Committee during the course of its work.

S/N	ORGANISATION
1.	9 Mobile
2.	A4AI
3.	AIRTEL
4.	ATC Nigeria
5.	ALTON
6.	ATCON
7.	BCDA
8.	CBN
9.	Facebook
10.	FMW&H
11.	Galaxy Backbone
12.	Globacom Limited
13.	GSMA
14.	Huawei Nigeria
15.	IHS Nigeria
16.	FMFBNP
17.	MTN Nigeria
18.	NCC
19.	NIGCOMSAT
20.	NIMC
21.	NIWA
22.	NNPC
23.	NRC
24.	NTEL
25.	ONSA
26.	Paradigm Initiative
27.	TCN
28.	UK Government
29.	World Bank

7.4 APPENDIX E: PRESIDENTIAL COMMITTEE 2020 - 2025 NATIONAL BROADBAND PLAN

Ms Funke Opeke (CHAIRPERSON) *CEO MainOne Cable Company Nigeria Ltd*	**Dr. Bashir Gwandu (VICE-CHAIRPERSON)** *Former Executive Commissioner, NCC*	
Prof. Mohammed Bashir Mu'azu *Dept. of Computer Engineering, ABU Zaria*	Mohammed Rufai *CTO, MTN Nigeria Communication Plc.*	Muhammad Rudman *President NIRA, MD/CEO IXPN*
Engr. Ngozi Ogujiofor *Director, Telecoms and Postal Services (TPS), FMoCDE*	Mohammed C. Babajika *Director Licensing & Authorization, NCC*	Ibrahim Dikko *MD/CEO BCN Nigeria Limited*
Akinwale Goodluck *Head of Sub-Saharan Africa, GSMA*	Engr. Ibraheem Mohammed *MD/CEO Gama Global Associates Ltd.*	AbdulHakim Ajijola *Consultancy Support Services Ltd*
Osondu Nwokoro *Green Fields Law*	Engr. Femi Williams *Representative Nigerian Computer Society*	Ahmad Abubakar Bello *Dynatech Solutions System Ltd*
Ayuba Shuaibu *Ag. Executive Sec. USPF*	Engr. Ubale Ahmed Maska (Member & Secretary) *Executive Commissioner NCC*	Bello Hayatudeen *Head, Virtual Assets & Cyber Intelligence, NFIU*
Mr. Olusola Teniola *President, ATCON*	Dr Abdullahi Gambo Usman (Member & Deputy Secretary) *Director Information Technology Infrastructure Solutions, NITDA*	Lt. Col. Aminu Ingawa *AD-ICT, Defense Space Administration*
Fatima Ibrahim-Haruna *ALTON*	Engr. AbdulRaheem Adajah *NIGCOMSAT*	Sidi Dennis *FMW&H*
Aremu Ade A. *MFB&NP*	Engr. Martin Ahachi *Director, Strategic Projects Galaxy Backbone*	Dr. T.A. Gaga *Director ICT, NIPOST*
Ubong Essien *Nigerian Governors Forum*		

Arc. Yusuf Kazaure *Chairman, NIGCOMSAT*	Mr. Stanley Jegede *Executive Chairman Phase3 Telecom*

Mrs. Rakiya Shuaibu Mohammed *Director IT, CBN*		Rev. Sunday Folayan *MD, General Data Engineering Services*
Engr. Fidelis Onah (PhD) *Consultant, Former Director Technical Standard & Network Integrity, NCC*		
Dr. Olufemi Adeluyi *FMoCDE, Coordinator*		Mr Mukhtar M. Sadiq *FMoCDE, Coordinator*
Engr. A.J. Maina *NCC, Secretariat*	Engr. Usman Aliyu *NCC, Secretariat*	Newman Omigie PhD. *FMoCDE, Secretariat*
Engr. Bello Usman *FMoCDE, Secretariat*	Engr. Nura Falalu *NCC, Secretariat*	Engr. Remigius Okoro *NCC, Secretariat*
Oji Ndukwe Uche *FMoCDE, Secretariat*	Engr. Ighor Kenobi *FMoCDE, Secretariat*	Nyam Emmanuel *FMoCDE, Secretariat*
Mrs. Unekwuojo Halliday *NCC, Secretariat*		
Egomaron Jegede *Deloitte & Touche*		Albert Okpala *Deloitte & Touche*
Belinda Danquah *Ernst & Young*		Emmanuel C. Ugah *Ernst & Young*