

Papua New Guinea National Broadband Plan 2022

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National Broadband Plan Pillars

This document presents the key Pillars of the National Broadband Plan. There are five main Pillars:

1. Infrastructure, Services, Meaningful Connectivity
2. Affordable Smart Devices
3. Broadband Applications and Content
4. Education, Training, Capacity Building
5. Government, Public Services

For each Pillar, the Plan provides an Overview discussion, the Objectives and Targets associated with the Pillar, and key Strategies for achieving those goals.

1. Pillar 1: Infrastructure, Services, Meaningful Connectivity

1.1. Overview

This pillar focuses on broadband network connectivity¹ needed for citizens to be able to access the Internet and all on-line services and capabilities. It includes underlying network infrastructure, delivery of broadband access services, and related facilities and connection options, as well as the need for such services to be affordable to all users. It encompasses the specific notion of “Meaningful Connectivity,” which encompasses elements of regular and reliable Internet access, sufficient data utilization, high speed connections, and affordable prices.

Key elements of this Pillar are described below.

- **Mobile Broadband Networks and Services:**

This topic addresses fundamental mobile broadband network infrastructure and service access in PNG. Mobile communications represent by far the most commonly used services in the

¹ Broadband network connectivity (in the context of this Plan) includes ‘First mile’ submarine Internet connectivity typically via sea cables (supplemented by satellite); ‘Middle mile’ operational terrestrial fibre backbone, mobile and Fixed Wireless Access (FWA) network connectivity; and ‘Last Mile’ Fibre to the Home/Premise (FTTH/P), FWA (including Wi-Fi and Mobile (2G, 3G, 4G, 5G) connectivity).

industry, and mobile broadband has become the default standard for accessing Internet and on-line applications throughout the world.

Until recently, the common standard for mobile data services has been 3G quality service, which allows users to access most mobile apps and on-line capabilities, but at relatively slow speeds, especially for high bandwidth uses such as video and images. The introduction of 4G/LTE network architectures has allowed for “true” broadband connectivity via mobile networks, providing access to a full range of higher-end apps and features, and accelerating the arrival of the broadband era. Most recently, a new 5G standard is being introduced in many countries, which has the potential to enhance the speed and latency of mobile data transmissions to unprecedented levels.

The goal to provide universal coverage of mobile broadband at the 4G or even 5G level is very challenging, especially for remote and rural areas with low population density. Backhaul networks must be built to reach these areas – whether fiber optic backbone or satellite transmission – and towers and cell sites must be constructed and maintained, with a variety of geographic and technical constraints. These challenges represent perhaps the most significant difficulty, and certainly the greatest investment, needing to be addressed by national broadband planning, policy, and cooperation.

In Papua New Guinea, these challenges are magnified by the extent of rural and remote locations, including unconnected or poorly serviced islands and territories with difficult terrain. The Government is committed to bringing high quality mobile broadband signals to all such area. This will be accomplished in part by extending a comprehensive national broadband backbone network to all geographic areas, allowing for direct national and international connectivity, and establishment of mobile towers and sites with robust broadband service, whether by existing licensed operators or new providers dedicated to serving all communities and citizens.

One option will be to support development of community networks where feasible. Community networks² have been established in numerous countries, usually in areas with little or no mainstream telecom network coverage. These networks are developed, financed, owned and operated by members of the local community in which they provide ICT services. As a wholly local operation, the services and pricing are geared toward the needs of the local community. Interconnection agreements with backhaul and other operators are needed, along with frequency assignments and other regulatory support to enable such networks.

- Fixed Broadband Networks and Services:

This topic involves development of fixed broadband networks and services, using either wired cable or wireless broadband technology platforms. Such fixed broadband networks provide

² Also referred to by the ITU, WTDC, etc. as “Complementary Access Solutions”, e.g. [BDT Director's Corner: Activities \(itu.int\)](https://www.itu.int/en/ITU-D/bdt-director/Pages/News.aspx?ItemID=292) - <https://www.itu.int/en/ITU-D/bdt-director/Pages/News.aspx?ItemID=292>

permanent connections to a subscribers' premises, whether to a household or residential complex, an office building or other business setting, government offices, university campuses, and similar institutional locations. Fixed wired networks often involve fiber-to-the-home/premise (FTTH, FTTP), although other technologies such as coaxial copper cable are also used. Fixed wireless broadband can be delivered over a variety of point-to-point systems, as well as via point-to-multipoint Wi-Fi, among other options. (Evolving 5G technology may also serve as a type of fixed wireless broadband.)

Fixed broadband networks typically offer higher capacity and more reliable services, and can usually be shared by multiple users simultaneously at the same location. They tend to cost more to subscribe and use than mobile broadband, but usage is often unlimited, with costs shared among all users. The PNG Broadband Plan envisions increasing expansion of fixed broadband options wherever commercially and technically feasible, especially for business and institutional users, as well as to households.

- Public Access Facilities:

Public access broadband facilities can offer a valuable option for individuals to obtain access to broadband services. Such public access can be especially valuable for lower-income users as well in more remote towns and villages, but they can also provide greater choices for all types of broadband users.

Public access to broadband can be provided via several approaches. A common service is the establishment of public telecenters, cyber cafés, and other forms of ICT access facilities, located in central areas within a community, which citizens can visit to rent computers and access Internet connections. These may be for-profit enterprises, Government run facilities, or various non-profit arrangements, typically offering broadband connectivity for low charges. Other services may also be available, such as technical training classes, printing and photocopying, and more. Another increasingly popular service option is public Wi-Fi service, which allows users to connect to wireless broadband signals in public areas, at a lower cost than most mobile broadband services. Public Wi-Fi can be provided by private establishments such as restaurants, and/or by government entities such as libraries, bus or rail stations, or across large public areas via mesh-Wi-Fi arrangements.

The Government is committed to ensuring widespread, affordable public broadband access throughout the country.

- Power Infrastructure:

For many users and communities, especially those in rural and remote areas, reliable power infrastructure is a real hinderance for building networks and maintaining service. The Government through DICT and NICTA will continue to take steps, including through UAS Fund Projects and other programs, to close gaps in the coverage in rural and remote areas that lack

adequate power by focusing on alternative options such as Solar, mini grids, off-grids, and low-power networks and solutions.

1.2. Objectives and Targets

Objectives	Time frames	Targets
Mobile broadband (4G+) access (% population coverage)	2027	75%
	2032	100%
Mobile broadband (4G+) penetration (% adult pop subscribers)	2027	40%
	2032	75%
Fixed network connections to households and small businesses (% penetration of target users)	2027	20%
	2032	50%
Broadband connections using alternative power infrastructure such as off-grid, solar, low-power or other similar technology	2027	15%
	2032	35%
Communities with public access facilities/service (% of designated communities)	2027	50%
	2032	80%

1.3. Strategies

Strategies	Responsible Parties
Policy, Regulatory	
<u>Open markets, Licensing</u> : Enable and expand access to new telecom operator licenses, including national and community based authorizations.	NICTA
<u>Spectrum</u> : Reform and implement effective spectrum allocation and assignments to encourage most efficient use for new and expanded broadband coverage.	NICTA
<u>Pro-competition policies, regulation</u> : Implement strong pro-competition regulation, such as infrastructure sharing and dominance enforcement, including legislative reforms necessary to allow most effective competitive market development.	NICTA, Legislature
<u>Universal public access</u> : Develop policies and regulations to promote universal deployment of public ICT access facilities and services, including public community Wi-Fi where there are clear market failures.	DICT, NICTA
Fiscal	
<u>License and spectrum fees, industry taxes</u> : Fees and taxes for telecom industry providers should be reduced and minimized to the extent possible to encourage	Legislature, Dept. of Finance, NICTA, DICT

investment, with particular incentives for rural networks and public access.	
<u>Rights of way</u> : Local fees for right of way access on public lands should be minimized and harmonized, and permit procedures simplified on a national basis.	Local govt authorities, Legislature, DICT, NICTA
Financing, Investment	
<u>Private sector investment</u> : Private telecom operators should commit to further investment and expansion of infrastructure and connectivity in unserved and underserved areas, and upgrade of their networks to reliable high capacity broadband for all.	Private telecom sector operators
<u>Universal Access Fund</u> : The Universal Access Fund will allocate priority resources to helping subsidize rural network infrastructure and connectivity, in partnership with private operators.	NICTA, UAF Board
<u>Government and donor funding support</u> : The Government will work with private industry, and also collaborate with donors to provide additional funding and investment support in critical national ICT infrastructure.	DICT, Government budget, donors
Public Projects, Initiatives, Partnerships	
<u>National backbone network</u> : The Government and private telecom operator partners will collaborate in the planning, investment, construction, and installation of the national backbone network, to bring high-capacity signals, including fiber optic and where necessary wireless broadband to all areas of the country, especially rural, remote, and isolated islands. This backbone network will also serve as the core infrastructure for the e-Government and e-education networks.	DICT, private telecom operators

2. Pillar 2: Affordable Smart Devices

2.1. Overview

This pillar addresses the need for all broadband users to have access to affordable, high-quality smart devices which can connect with the Internet and apps, communicate with others via various media, and provide the full range of features enjoyed by ICT users worldwide. As the broadband economy and digital society progress, the role of smart devices will continue to become more essential, and will be integrated more into every aspect of people's lives. PNG must ensure that the entire broadband sector continues to adapt and evolve as technologies improve, and that the most advanced and useful devices are always available.

- **Affordable smart phones for individuals and households**

The most common and important category of devices are smart phones, which have rapidly emerged to become an essential tool for virtually every citizen to participate in the modern digital society. These devices are not merely used for traditional voice telephone calling or basic text messaging, but have come to serve as the primary mechanism by which people connect with each other, and with the wealth of information and applications available on-line. They also serve multiple other useful functions: as cameras, clocks, health monitors, entertainment media, navigation tools, banking and payment devices, and so much more. Quite simply, it is impossible to participate meaningfully in today's digital world without owning a reasonably advanced smart phone.

The key challenge for many people, however, is that the highest-end smart phone models can be extremely expensive, and even more basic devices can be too costly for many individuals. In many households, one solution has been to share a single smart phone among family members; however, this practice limits the value of the device and connection, and often restricts access for some persons, particularly women.

There is thus a critical need to expand availability and decrease costs for high quality smart phones throughout the country, with special emphasis on making sure that those who have been unable to afford such devices can obtain them at a reasonable cost – even where network connectivity is available, and even within some households where at least one such phone may already be in use. The Government will support efforts by private sector providers, operators, and community organizations to make more affordable smart phones available, including via targeted subsidies.

- **Personal computers, laptops, tablets**

Although the smart phone has become by far the most dominant device by which most people access on-line digital services, more traditional personal computers, laptops, and tablets remain an important component of the broadband ICT ecosystem. Many important functions rely upon

these more robust devices, with larger displays and more complex software, including the bulk of business, educational, entertainment, and government activities. The sophistication and flexibility of this segment of the device market has continued to increase, while costs have continued to decline. For a large proportion of users, therefore, access to these types of computers will remain at least as important as access to smart phones.

Most programs to promote and distribute PCs, laptops, and tablets are linked to the various types of institutions that utilize them the most: businesses, schools, Government offices, etc. For many households, there may be a multiple benefits to having an in-home computer, whether for students, employees working from home, self-employed entrepreneurs, or general shared use. The Government therefore will consider supporting programs which enable more affordable ownership of appropriate computer devices at the household level, in addition to sector-specific adoption programs, with a general goal of increasing penetration of PCs and equivalent devices nationwide.

- Other smart devices, Internet-of-Things

There are a wealth of additional devices, expanding all the time, which incorporate broadband connectivity and smart functionality, creating new and more convenient ways of performing countless tasks and activities. These include, for example: digital assistants, smart TVs and speakers, smart watches, video gaming consoles, automobiles, cash registers and payment platforms, shipping and transport manifests, and a host of other devices in virtually every sector of the economy and society. In general, the role of digitally connected machines has come to be labeled the “Internet of Things,” foreshadowing a near future where nearly every inanimate object around us may be actively on-line at any time.

Many of these more advanced types of devices are not yet in widespread use in PNG, but it is certain that the public, as well as businesses and government, will continue to adopt and integrate all kinds of smart digital equipment along with the rest of the world over time. The Government intends to encourage and support continued improvement and adoption of these advanced devices throughout the society and economy.

2.2. Objectives and Targets

Objectives	Time frames	Targets
Smart phone overall penetration (% of adult population)	2027	40%
	2032	65%
Smart phone individual ownership by women (% of adult women)	2027	35%
	2032	50%
Smart phone and/or computer ownership by persons with disabilities	2027	20%
	2032	60%
Computers, tablets in households, businesses, organizations (% penetration by adult population)	2027	15%
	2032	45%
Adoption of advanced personal smart devices (% penetration by household)	2027	10%
	2032	40%
IOT adoption, integration by businesses (% of businesses utilizing)	2027	20%
	2032	50%

2.3. Strategies

Strategies	Responsible Parties
Policy, Regulatory	
<u>Imports, distribution</u> : Encourage import and local assembly and distribution of all devices, with limited restrictions.	Department of Trade and Industry
<u>Type approval</u> : Expedite approval of devices with minimal delay or cost.	NICTA
Fiscal	
<u>Import tariffs</u> : Minimize or waive import tariffs on smart phones, PCs, and other advanced ICT devices.	Department of Finance, Dept of Trade & Ind
<u>Tax incentives</u> : Establish tax incentives, deductions, credits for purchase and adoption of smart devices, by households and businesses. Create tax incentives for suppliers of smart devices to reduce prices for low-income and small business users.	Legislature, Department of Finance
Financing, Investment	
<u>Industry initiatives</u> : Telecom operators and suppliers establish low-income, low-price device purchase options, affordable payment plans.	Private telecom sector companies, device suppliers
<u>Public subsidy programs</u> : Adopt device subsidy programs via the UASF and/or other public funding for designated	Universal Access and Service Fund; special public subsidy funds

<p>qualified users, including low-income, rural, students, , women, persons with disabilities. <u>This also can fund</u> connected devices with accessibility features, such as compatibility with software providing screen magnification, screen reading functionalities.</p>	
Public Projects, Initiatives, Partnerships	
<p><u>Government, donor bulk purchase, distribution:</u> Government agencies (and/or donors) purchase bulk device lots from partner suppliers for designated user groups (education, govt offices, health facilities, libraries, post office ,etc.). Provisions for Schools, libraries, health facilities and others to purchase connected devices with accessibility features, such as compatibility with software providing screen magnification, screen reading functionalities, and captioning services; larger screens; enhanced resolution; and touchscreens for students with significant fine motor skills difficulties.</p>	<p>Government department budgets; donor contributions</p>

3. Pillar 3: Broadband Applications and Content

3.1. Overview

This pillar addresses the need to develop and ensure access to a robust range of useful, beneficial, and valuable broadband ICT applications and content for all segments of PNG society. Clearly, it is the content of information and applications that is the true lifeblood of the Internet and the digital world. Absent useful content, these networks and devices would be dramatically less useful. This implies that the value of participating in the broadband society for any individual or organization is directly related to the nature, scope, and relevance of the digital content that they are able to access.

The virtually infinite range of material that is available on-line has evolved mainly through the organic process of decentralized creative and commercial initiatives around the world for the past few decades. However, there remains a need to help support further development of digital content and applications that address the specific needs of a variety of users throughout PNG society. At the same time, with increasing access come increasing risks of potentially harmful content and actions in the on-line environment, and it is critically important to minimize these negative effects, especially for the most vulnerable users. The Government must strike a careful balance between enabling, promoting, regulating, and securing digital

applications and content, to ensure the most beneficial development of the broadband ecosystem in PNG.

The following topics are included within this pillar of the Broadband Plan.

- Applications and software development

There are countless on-line applications, web sites, and interactive services available via the global Internet, which any connected user can access, typically with few restrictions. For many users, however, the range of options may not always provide the most valuable or useful functions or information. In particular in a small but highly diverse market such as PNG, the applications available mostly from international sources may lack relevance on multiple levels. There is a need for customized apps which are based in local languages, customs, environments, and cultural interests, and which reflect the interests and needs of the PNG population.

These gaps also create opportunities for domestic developers, innovators, and entrepreneurs to establish profitable businesses in the software and applications field in PNG. The Government encourages and supports the growth of this domestic industry, and will establish an Incubator, as well as the Cluster Initiative under the Digital Government Plan, to assist in their development. All Software and applications developed must meet the W3C's WAI guidelines. [Essential Components of Web Accessibility](#) shows how web accessibility depends on several components of web development and interaction working together, and how the WAI guidelines (WCAG, ATAG, UAAG) apply.³ In many cases, customized software and applications will be particularly useful in fields such as education, health care, government service, and local businesses; these are further addressed in other sections of this Broadband Plan.

- Information, entertainment, social media

The most extensive types of content usage in the broadband ICT world involve various forms of information sharing, entertainment applications, and social media networks, all of which offer endless diverse opportunities for users to connect, learn, enjoy, advocate, and experience within the limitless world of cyberspace. The fact that there are so many millions of choices, and an infinite depth of content generated by global conglomerates and local neighbors alike is what has driven the exponential growth of the digital era.

For PNG citizens to enjoy the full benefits of a universal Broadband experience, they not only need to connect with and gain access to these many content sources, they must also be able to

³ Web "content" generally refers to the information in a web page or web application. WCAG applies to dynamic content, multimedia, "mobile", etc. WCAG can also be applied to non-web information and communications technologies (ICT). Authoring tools are software and services that "authors" (web developers, designers, writers, etc.) use to produce web content. See. <https://www.w3.org/WAI/standards-guidelines/>

discover and contribute to information, applications, and knowledge sharing that is specifically relevant to them. While the many existing web sites, apps, and social media networks certainly allow unlimited options for users to download and upload valuable content, it is also important to encourage and enable more custom and focused material tailored to the interests of PNG's diverse population and culture.

The Government's Broadband Policy thus supports two approaches to information content development and access: (1) open and relatively unrestricted development and deployment of on-line apps and information content from any source; and (2) support and promotion of PNG-focused and locally developed cultural and user-driven apps and content.

- Security and protection

There are many serious risks associated with using on-line services and entering cyberspace. The most prevalent risks can be generally classified as follows:

- Network security
- Privacy, identity, and data protection
- On-line fraud and exploitation
- Harmful and abusive content
- False information, propaganda, and spam

In each case, there is a need to establish strong, reliable, and consistent safeguards, both by the digital industry providers and by Government regulators and security officials. When users feel secure and confident in the quality of the services and information that they access, and when they can trust in the safety of their on-line activities, they will be more inclined to adopt these technologies and utilize them in productive ways.

3.2. Objectives and Targets

Objectives	Time frames	Targets
Increase in # of IPA registered SMEs and MSMEs in ICT sector	2027	50%
	2032	80%
% of IPA registered SMEs and MSMEs participating through the Cluster	2027	100%
	2032	100%
Access and use of domestic sites, apps, content (by user surveys: % utilizing one or more per week)	2027	25%
	2032	50%
Revenues generated by domestic ICT-based businesses (% increase per year)	2027	10%
	2032	20%
% of population uploading original content to social media sites (by user surveys)	2027	30%
	2032	60%
% of public bodies monitored by the National cyber center	2027	100%

	2032	100%
Improved ranking in National/Global Cyber Security Index	2027	50 th
	2032	40 th

3.3. Strategies

Strategies	Responsible Parties
Policy, Regulatory	
<u>Limited regulation of apps and content</u> : Enable and encourage PNG providers and developers to deliver innovation applications without undue restrictions.	DICT, NICTA
<u>Open, affordable access regulation</u> : Adopt regulatory practices which encourage low-cost or free access to popular media and apps, while ensuring neutral, equitable access across all platforms.	DICT, NICTA
<u>Standards based software, applications, and web services ensure that all content meets the W3C's WAI Guidelines</u>	DICT, NICTA
<u>Domestic hosting</u> : Encourage hosting of international data caches and warehouses with minimal barriers.	DICT, NICTA
<u>Cyber security</u> : Reinforce and expand resources for prevention, investigation, education, and intervention to reduce instances of on-line abuse, misinformation, and security threats at all levels.	DICT, NICTA, National Cyber Security Centre
Fiscal	
<u>Tax incentives</u> : Allow domestic applications and content developers tax savings on revenues generated from qualified products and services.	Department of Finance
Financing, Investment	
<u>Public ICT Incubator</u> : Develop and finance public ICT Incubator and Clusterization Strategy to finance and support entrepreneurs developing domestic apps, content, and ICT-based businesses.	DICT, NICTA, Government budget
Public Projects, Initiatives, Partnerships	
<u>Local ICT content development</u> : Develop projects to encourage local, indigenous and disadvantaged groups to digitalize and upload social and cultural content.	Local Government Units, Schools, NGOs

4. Pillar 4: Education, Training, Capacity Building

4.1. Overview

This pillar addresses the role of broadband ICTs in all aspects of education and related training and capacity building objectives in PNG. It incorporates all such components under a single Pillar, as there is considerable overlap among stakeholders and beneficiaries of all types of ICT education and training institutions and programs. There are three main topics discussed below.

- **Broadband in Public Primary and Secondary Education:**

The importance and opportunities of modern digital technologies for contemporary education have been increasingly recognized for some time. But during the Covid-19 pandemic their role has become vastly more critical, as quarantines and lockdowns forced countless schools, teachers, and students to rely upon remote learning – where possible – and stranded many others with very limited educational options. Even with the return to in-class learning, the need for greater equity and opportunity in ICT deployment in public education remains paramount.

Broadband resources can play a key role in numerous aspects of basic primary and secondary education. Areas key elements that must be enhanced under this Broadband Plan are:

- Digitally enhanced curriculum, such as interactive and on-line modules, as well as standardized testing;
- High-quality audio-visual presentation materials, that are made accessible for people with disabilities to supplement traditional books and blackboards;
- Access to on-line information, to support research, homework, and instruction;
- Connectivity among students and teachers, allowing for direct communication for collaboration and support outside the classroom;
- Inter-school communications, allowing students and teachers to connect across different locations, even world-wide;
- Remote teaching and assignments, including for students who may be unable to attend school in-person for any reason;
- On-line teacher training and development programs;
- Digital school administration systems, to support planning, budgets, schedules, and resource assignments.

Many technical resources needed to enable these benefits from broadband education, and their deployment and adoption must be carefully coordinated throughout local, regional, and national school systems. These requirements must be supported by a comprehensive and coordinated policy which ensures that they will be utilized effectively in schools, in appropriate practices that combine with traditional public, teacher-centered education.

- Broadband in Universities:

The role of broadband ICTs in university education is similar to that in primary and secondary schools, but even more extensive and important. Computers, digital curriculum, and on-line access have become essential to modern higher education, and any students or campus that lack these technology resources are at a severe disadvantage. Even where connectivity may be somewhat available, significant upgrades may be required; today's universities require robust, high quality broadband access, along with the latest hardware and software, for students to truly obtain the skills and expertise they will need after graduation.

University-level broadband ICT resource needs fall into three general categories:

- Equipment: Computers, smart boards, audio-visual devices, tablets, servers, etc., for classrooms, students, teachers, and administration
- Software: Digital curriculum, testing, research materials, remote learning modules, administration applications
- Connectivity: Broadband Internet connections to the campus, together with on-campus Local Area Networks and Wi-Fi for students, teachers, administration, classrooms; student e-mail accounts, access to professors, on-line submission of assignments

An effective university must have all of these available to provide a complete contemporary educational environment. They are even more critical for programs related to computer science, communications, electrical engineering, and related fields. The PNG Broadband Plan will devote substantial resources, including through partnerships, to ensure access to these needs throughout the higher education system.

- Technical Training and ICT Awareness Programs:

This topic covers both formal technical training programs and public ICT awareness and capacity building initiatives. As the importance of ICTs has grown exponentially, the need and opportunity for training and development of the technical labor force has increased just as fast. The availability of highly skilled workers, however, has generally not kept pace with this need, due to insufficient resources and options for this type of targeted, advanced training for many potential candidates. Strategic investment in technology training can yield benefits considerably sooner than long-term focus on overall ICT in education programs, by supporting post-graduate students or partially trained workers to improve their skills and specialize in the priority functions associated with the expanding broadband marketplace. Ultimately, the broadband ecosystem will only succeed to the degree that PNG citizens join this sector as fully capable workers and employees.

There can be a variety of technical training programs which can be included and promoted as part of the Broadband Plan, including:

- Stand-alone or independent technical training schools and programs, which may include both traditional in-person classroom settings, and/or on-line or hybrid training options.
- University-based or affiliated programs, including technical degree options as well as non-degree, certification, or career enrichment training classes.
- Corporate-based training initiatives, which may also be offered independently or in coordination with university or other training institutes.
- Government sponsored training programs, which can also be offered stand-alone or in partnership with any of the above.

Beyond these formal types of ICT-based training, there is also a more general need to promote widespread awareness and training among all citizens and organizations in PNG in the understanding and use of broadband ICTs. As these technologies continue to penetrate further into all aspects of society and the economy, end users in every group and all locations will have growing needs to learn how they can best adapt to the digital world.

There are several different options for how the Broadband Plan will support public ICT awareness and capacity building objectives. These may include:

- Public ICT beginner training classes at local community centers, schools, public offices, etc.
- On-line support and awareness programs.
- Public relations campaigns, utilizing a combination of media, to reach out to less experienced users or disadvantaged groups to encourage their awareness of ICT benefits.
- Local “Help” and technical support personnel, who can be available at a public place to assist users.
- Partnerships with mobile operators, equipment suppliers, schools and universities, libraries, and local governments offices.

The Government will devote resources and develop partnerships in any of these areas where the most effective and beneficial opportunities arise.

4.2. Objectives and Targets

Objectives	Time frames	Targets
Connection of primary and secondary schools (% of schools connected)	2027	30%
	2032	70%
Connection of university campuses and classrooms (% connected)	2027	60%
	2032	100%

Students using digital devices (% using)*	2027	35%
	2032	80%
Distance learning program utilization (% of total students)*	2027	10%
	2032	25%
Introduction of ICT curriculum/training in secondary schools and universities (% of students taking ICT related courses)*	2027	20%
	2032	40%
ICT training program utilization (# of persons trained/year)*	2027	20,000
	2032	50,000
% of population utilizing digital skills (from surveys)*	2027	50%
	2032	80%

* Targets should include equal #s of males and females

4.3. Strategies

Strategies	Responsible Parties
Policy, Regulatory	
<u>E-curriculum</u> : Develop and adopt standardized digital curriculum platforms, content.	Dept of Education
Fiscal	
<u>Tax incentives</u> : Incentives and deductions for purchase of student/school digital devices; also for providing ICT training to employees, partners	Dept of Finance
Financing, Investment	
<u>UAF subsidies</u> : Funding support for school connectivity and for student digital devices	NICTA, UAF
<u>Education budget</u> : Priority budget allocations for connectivity, digital curriculum, teacher training.	Dept of Education, and Dept of Higher Education, Research, & Tech
Public Projects, Initiatives, Partnerships	
<u>National e-educational network</u> : Coordination of school and university connectivity with national backbone and e-government network development, in partnership with private sector telecom operators.	DICT, Dept of Education, DHERST, private sector telecom operators
<u>Public-private partnerships for training</u> : Public support for training programs by private industry.	Dept of Education, private sector partners

5. Pillar 5: Government, Public Services

5.1. Overview

The Government of PNG recognizes that full achievement of the country's national broadband ICT objectives depends strongly upon adoption and utilization of these technologies within Government itself at all levels. Toward this goal, the legislature has recently adopted the Digital Government Act, and the Government has launched the related Digital Government Plan (2023-2027), which aims to improve efficiency and functionality across PNG Government agencies through adoption of common digital standards, platforms, services, and practices. The specific goals of the Digital Government plan are:

1. utilize relevant and appropriate digital technology platforms to increase revenue;
2. use appropriate digital technology platforms to deliver public services more effectively and efficiently; and
3. use appropriate digital technologies to digitally track development indicators real-time.

Under this Broadband Plan, the Government will continue to implement and expand upon the provisions and objectives of the Digital Government Plan, and ensure that its objectives are closely integrated with and complementary to the other major objectives for national broadband ICT development. Among the key areas of focus are the following.

- E-Government infrastructure and network connectivity:

One of the top priorities of both the Digital Government Plan and Broadband Plan and the is to support the construction, expansion, and installation of the national e-government broadband digital network, to connect all public buildings and offices to a single unified network. This network will be linked to the national backbone infrastructure, to be built and managed by private sector telecom operators under a consolidated contract with the Government. It will provide robust connectivity to all designated government locations, along with appropriate in-building wiring and wireless connections, equipment, and software platforms.

The e-government network will provide broadband connections to each Department, agency, service, and location which will ensure high-quality and secure on-line access, both within the national private network and to outside Internet servers. Client sites on the network will include Department administrative offices, public health clinics and facilities, post offices, police and security forces, and any other identified user organizations. Each agency or Department will be responsible for designating the sites and levels of service to be connected.

The network will also incorporate shared data centres to host secure files and archives as well as web sites and other on-line service platforms. It will also employ standardized protocols for data transfer and storage, and for government e-mail, text, voice, and video communications. The network will be planned and implemented under DICT direction as part of the Digital

Government Plan, in collaboration with the ICT Sector Steering Committee and partner organizations.

- Digitalization of public services and data:

As detailed in the Digital Government Plan, all agencies will be tasked with the implementation of digital services to take maximum advantage of the efficiencies and opportunities of broadband digital technologies. Under the Plan, a Government-wide on-line services Portal will be developed and agencies will coordinate migration of data, services, and functions to the shared public sites. The Plan identifies a broad range of key digital services to be implemented over a five-year period, in the areas of Government-to-Citizen (G2C), Government-to-Business (G2B), and Government-to-Government (G2G) activities.

Among the priority services to be supported with digital technologies are e-Health and e-Agriculture, which represent vital aspects of public resources and needs that affect most PNG citizens. In these and other key areas, the relevant Departments will be responsible to develop and implement specialized applications for internal use and public communication. All digital platforms and services will employ advanced, reliable security and data protection measures.

Under the program, the Government will also prioritize establishment of electronic procurement and payment mechanisms for financial transactions wherever possible.

- Local government adoption of broadband ICTs:

The advantages and goals of broadband digital government practices and plans must also be extended to government units at the local level throughout PNG. Under the Digital Government and Broadband Plans, the initiatives to digitalize public records and services will also be extended to Local Government Units in all Districts. This will include all levels of connectivity, equipment, software, and applications necessary to allow for local public services to be available on-line in the most efficient manner possible.

- Public Service employee training:

An essential component of government digitalization is the training of all public service employees in the use of these technologies in their job responsibilities. As part of the Digital Government Plan, there will be established a centralized set of training programs to be offered to all public service personnel. This training will include instruction in the use of all relevant software and applications involved in employees' work. It will also familiarize them the basics of digital equipment installation, maintenance, and repair, and the with the general nature of the services and functions that are being adopted.

5.2. Objectives and Targets

Objectives	Time frames	Targets
E-Government network and connectivity (% of national offices, sites connected)	2027	100%
	2032	100%
Local government connectivity (% Districts connected)	2027	100%
	2032	100%
Digitalization of services and data (% of priority functions and data digitalized)	2027	75%
	2032	100%
Utilization of digital government by citizens (% of citizens utilizing one or more services)	2027	70%
	2032	90%
Health clinic connectivity (% of clinics connected)	2027	65%
	2032	80%
Utilization of digital e-Agriculture services by farmers (% of farmers utilizing digital services)	2027	50%
	2032	75%
Public Service employee training (% of personnel trained)	2027	50%
	2032	100%

5.3. Strategies

Strategies	Responsible Parties
Policy, Regulatory	
<u>Digital Government Act, Plan</u> : Full adoption, planning, and resource allocation to support implementation.	DICT, ICT Sector Steering Committee
Fiscal	
<u>Tax revenue</u> : Ear-mark a portion of tax revenue from ICT firms and digital services for Digital Government costs	IRC & Dept of Treasury
<u>Electronic taxation</u> : Prioritize digitalization of tax payments, collections, accounting to increase savings and efficiency from digital government plans	Department of Finance and Treasury
Financing, Investment	
<u>Budget allocations</u> : Establish a Government-wide budget allocation to support costs of Digital Government Plan, including specific allocations for local government units' digitalization.	DICT, ICT Sector Steering Committee, Department of Finance,
<u>Donor contributions</u> : Solicit donor support for Digital Government programs.	DICT, ICT Sector Steering Committee

Public Projects, Initiatives, Partnerships	
<u>E-Government network</u> : Partnership between Government and private sector telecom operators to plan, build, install, and manage a government-wide broadband network, hosting all public data and services.	DICT, ICT Sector Steering Committee, all agencies, Private sector ICT firms
<u>Digital Government Services</u> : Priority G2C, G2B, and G2G services will be digitalized and implemented according to the Digital Government Plan.	DICT, ICT Sector Steering Committee, all Departments, agencies
<u>E-Health</u> : The service will target health workers, patients, and general communities. It will enable medical specialists to connect with medical workers in community clinics and health centres, and to provide health and welfare information to patients and citizens online.	
<u>E-Agriculture</u> : Implement online service to enable citizens, local farmers, and businesses to access information, knowledge, networks and institutions locally and globally to increase agricultural productivity, income and reduce risks	