Tuvalu National Broadband Plan 2024

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Prepared by GDIP and DCCP Pacific

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Foreword

This document presents a proposed National Broadband Plan (NBP) for Tuvalu. This plan is modeled after similar NBPs developed by a variety of different developing countries to support the national objective of extending broadband information and communication technology (ICT) equitable access, utilization, and benefits throughout Tuvalu's society and economy.

This plan represents a first effort in the creation of the formal NBP and is based on the outline previously prepared and reviewed with Tuvalu stakeholders. This plan may be modified and enhanced as a result of additional consultations and deliberations by public and private stakeholders across the country. Consultations should focus on validating objectives, targets, timelines, priority actions, and the complementary roles of government, ICT industry players, private sector companies, public institutions, NGOs (including women's organizations, consumer protection agencies, and those working on digital connectivity and development projects, among others), and the general public (including representatives of marginalized groups, such as rural populations, women, and persons with disabilities).

Glossary of terms and acronyms

3G	third generation of wireless mobile telecommunications technology
4G	fourth generation of broadband cellular network technology
4G+	an enhanced version of the 4G network (LTE Advanced)
4G LTE	long-term evolution (LTE) is a standard for wireless broadband communication
5G	fifth generation of wireless cellular technology
Broadband	transmission of high-quality data of wide bandwidth, a high-speed internet connection that is always on
CSR	corporate social responsibility
DCCP	Digital Connectivity and Cybersecurity Project
DGP	Digital Government Plan
Digital Tuvalu	a project of the Tuvalu government to make the country the First Digital Nation
Funafuti	the capital of Tuvalu
FTTX	fiber to the premise technology
FWA	fixed wireless access
GEO	geostationary satellites
GPON	Gigabit-capable Passive Optical Network
ICT	information and communication technology
IoT	Internet of Things
ITU	International Telecommunications Union
LAN	local area networks
LEO	low Earth orbit satellites
MEO	medium Earth orbit satellites
MSMEs	micro, small, and medium enterprises
MTECI	Ministry of Transport, Energy, Communications, and Innovation
NBP	National Broadband Plan
Open RAN	Open Radio Access Network
RBPF	Rural Broadband Policy Framework

Te Kete	Tuvalu's National Strategy for Sustainable Development (2021-2030)
Te Sikulagi	Tuvalu's 2020 Foreign Policy
TTC	Telecommunications Corporation
UAS	universal access and service
VPN	virtual private networks
WAN	wide area networks
WiFi	Wireless Fidelity, refers to any type of IEEE 802.11 Wireless Local Area Network (WLAN)
XGS-PON	10-gigabit Symmetric Passive Optical Network

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Minister's Foreword

I am pleased to present the first Tuvalu National Broadband Plan. Our government is committed to developing policies and practices that ensure that all citizens have access to universal, meaningful, and affordable broadband information and communication technologies and services so that they can benefit from all of the advantages of the digital revolution. This includes not only the residents of Funafuti and Vaitupu but also all the islands and areas where Tuvalu citizens live and work.

Our Ministry is dedicated to meeting all the goals set out by the UN Broadband Commission for Sustainable Development, and the introduction of this National Broadband Plan will allow us to meet the objective, which states that by 2025, all countries should have a funded national broadband plan or strategy or include broadband in their universal access and service (UAS) definition. This plan will also help us achieve the other targets the UN Broadband Commission set out, such as making broadband meaningful, accessible, and affordable to all. Meaningful connectivity requires that all users, including those in rural areas, have access to sufficient network transmission connectivity and speed, sufficient data utilization caps at reasonable prices, and the ability to connect as frequently as needed to incorporate advanced ICTs in their lives.

The National Broadband Plan addresses five critical and interdependent focus areas, setting key targets and defining a range of strategies for achieving them. It highlights the need to invest in high-quality broadband infrastructure and service connectivity on all islands. It promotes the availability of affordable and accessible devices for everyone. It supports the development of meaningful and commercially viable digital content and applications and internet-based businesses. It highlights the need to incorporate broadband technologies and connectivity across the education system and to provide skills training and awareness building throughout the population. It also reinforces our Digital Government Plan to ensure public sector services are available online. All of these objectives are aimed at inclusive and equitable broadband access for every Tuvalu citizen, with emphasis on opportunities for women, persons with disabilities, those with low incomes and those who live in remote and rural locations.

The National Broadband Plan also aligns closely with the government's Digital Tuvalu, the First Digital Nation initiative. Our country's precarious vulnerability to the effects of climate change has led us to launch this ambitious program to produce a comprehensive digital record of Tuvalu's land, people, history, and culture, to preserve our unique community in the event that our physical space is lost to rising seas. Under the National Broadband Plan, participation in the Digital Tuvalu program will be further encouraged and enabled through links to connectivity, device distribution, and education-based activities at all levels.

This National Broadband Plan represents a critical, high-priority strategy for uplifting our people and expanding and preserving Tuvalu's national economy, culture, and people. We have a lot of work to do, but with this blueprint, we will ensure the full participation of all citizens in our digital future.

Executive Summary

Part I: Context and Purpose

The National Broadband Plan (NBP) describes the vision, objectives, targets, strategies, and implementation plans for expanding and adopting broadband information and communication technologies (ICTs) in Tuvalu to support the country's overall economic and development goals.

Tuvalu's ICT sector is characterized by a single government-owned telecommunications provider, Tuvalu Telecommunications Corporation (TTC). TTC is the sole provider of the government's telecommunications services to the entire nation using 3G, 4G LTE, and eventually 5G technology. TTC provides fixed, mobile, and satellite broadband services, predominantly on two of the nine islands — Funafuti and Vaitupu.

As of the beginning of 2024, Tuvalu has progressed in digital technology accessibility and adoption as TTC and the government progressively expand their digital transformation plans using 4G LTE and satellite broadband technology. Mobile broadband penetration is about 68% of the population in Funafuti and Vaitupu, which equates to 41% of the population nationwide.

The government's vision is to achieve universal, meaningful, and affordable broadband connectivity by 2030. This requires that every citizen have the opportunity to enjoy a safe, satisfying, enriching, productive, and affordable online experience and be able to participate fully in the modern digital society and economy.

The NBP is organized around five key focus areas across the full scope of the broadband ecosystem. Each of these areas must be addressed together and in coordination to achieve the country's vision and objectives for broadband ICT-driven growth and opportunity.

Part II: National Broadband Plan Focus Areas

This section presents the key focus areas of the National Broadband Plan. For each focus area, the plan provides an overview discussion, the objectives and targets associated with the focus area, and key strategies for achieving those goals.

Focus Area 1: Broadband Infrastructure and Services

This focus area addresses the broadband network connectivity needed for Tuvalu citizens to be able to access the internet, mobile data apps, and related services and functions. 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.

Objectives, Targets, and Strategies are defined for:
- Mobile broadband access and service
- Public access broadband services

Focus Area 2: Affordable and Fully Accessible Smart Devices

This focus area addresses the need for all broadband users to have access to affordable, high-quality smart devices that can fully connect to the internet and applications.

Objectives, Targets, and Strategies are defined for:
- Smartphone penetration and adoption
- PC, laptop, tablet penetration and adoption
- Advanced devices penetration and adoption

Focus Area 3: Broadband in Business Applications and Content

This focus area addresses the role of broadband in the Tuvalu business community, including support for commercially and socially valuable applications and content. Tuvalu's digital economy will depend upon the development and use of a broad range of applications that are universally available and adopted throughout society.

Objectives, Targets, and Strategies are defined for:
- Applications and software development
- Digital finance
- Cultural information, entertainment, and social media
- Security and protection

Focus Area 4: Broadband in Education, Training, Capacity Building

This focus group addresses the role of broadband in all aspects of education, training and capacity building in Tuvalu, with a priority goal of enabling citizens, students, and entrepreneurs to take maximum advantage of the benefits of broadband ICTs in their lives and occupations.

Objectives, Targets, and Strategies are defined for:
- Broadband in public education
- Broadband in universities
- Technical training and ICT awareness programs

Focus Area 5: Broadband in Government and Public Services

This focus area addresses issues associated with broadband in the public sector. Under the broadband plan, the government will continue to implement and expand upon the provisions and objectives of the Digital Government Plan (DGP) and ensure that its objectives are closely integrated with and complementary to the other major objectives for national broadband ICT development.

Objectives, Targets, and Strategies are defined for:
- E-government infrastructure and network connectivity
- Digitalization of public services and data
- Public service employee training

Part III: Implementation Strategies and Actions

This section describes the institutional framework for overseeing and managing the implementation of the plan. It also describes the framework and timing for the initial action plans that the oversight institution must develop.

Implementation Oversight and Action Plans

The primary responsibility for plan oversight will rest with the Tuvalu Ministry of Transport, Energy, Communications, and Innovation (MTECI). The ministry will establish a Broadband Plan Oversight Office, responsible for directing and monitoring plan implementation in consultation with other stakeholders. A Broadband Steering Committee will also be established to develop shared plans, strategies, and coordinated initiatives across multiple interest areas.

The Broadband Plan Office will oversee the preparation of detailed implementation action plans for each program or distinct project to be undertaken within the broadband plan framework. The Implementation Action Plans will provide sufficient information for stakeholders and the public to understand the specific expectations for each project, the tasks required to achieve their identified target outcomes, the resources involved, and the associated time frames.

The NBP will be closely aligned with Digital Tuvalu, the First Digital Nation project, and the Digital Government Plan. A key initial action plan will be developed to link the broadband plan to Digital Tuvalu. This plan will connect several of the broadband plan's focus areas and objectives under a coordinated set of activities.

Monitoring and Evaluation

Implementation of the broadband plan and progress toward the targets must be regularly monitored and evaluated. This section describes the plan's monitoring and evaluation (M&E) requirements, including institutional responsibility. It also establishes the need to review and revise the plan based on interim progress reports.

Part I: Context and Purpose

1. Introduction and Overview

The National Broadband Plan describes the vision, objectives, targets, strategies, and implementation plans for expanding and adopting broadband ICTs in Tuvalu to support the country's overall economic and development goals.

This plan has been developed under the auspices of the Ministry of Transport, Energy, Communications, and Innovation and the Tuvalu Telecommunications Corporation, with the support of the USAID Digital Connectivity and Cybersecurity Project (DCCP), and in coordination with other public and private sector stakeholders, and in view of international and regional best practice examples. The NBP will provide the foundation for initiatives and efforts within Tuvalu's ICT sector and society to promote efficient and effective development of broadband technologies and services throughout the country. It is being adopted and implemented in parallel with other government initiatives relating to ICT and digital development.

The plan consists of the following sections:

- Part I: Context, Purpose
    1. Introduction and Overview
    2. Background and Sector Status
    3. Vision and Objectives
    4. Summary of Broadband Policy Themes and Approaches

- Part II: National Broadband Plan Focus Areas
    5. Focus Area 1: Broadband Infrastructure and Services
    6. Focus Area 2: Affordable and Fully Accessible Smart Devices
    7. Focus Area 3: Broadband in Business Applications and Content
    8. Focus Area 4: Broadband in Education, Training, Capacity Building
    9. Focus Area 5: Broadband in Government and Public Services

- Part III: Implementation Strategies and Actions
    10. Implementation Oversight and Action Plans
    11. Monitoring and Evaluation

2. Background and Sector Status

2.1. Brief overview of the country

Tuvalu is an independent island nation in the South Pacific comprising nine coral atoll islands with a population of about 11,400 people. The population comprises 51.2% male and 48.8% female. Six of these islands have lagoons open to the ocean, two have significant non-beach land regions, and one has no lagoon. Its capital, Funafuti, is located on Funafuti atoll island, the most populous of the country's nine atoll islands. The total land area of Tuvalu is 26 square kilometers, and its low-lying islands are about 4 meters above sea level.

Tuvalu's principal revenues derive from fishing license fees, trust fund investments, official development assistance, dotTV domain name royalties, and remittances from expatriate workers.

The geographical location of Tuvalu has created a sustained susceptibility to climate change, particularly rising sea levels, which threaten the existence of Tuvalu as a nation. Tuvalu is confronted with this threatening reality owing to global warming and other climate change impacts, including the increased incidence and severity of weather events such as cyclones and storm surges. The continual erosion and adverse impacts of climate change are affecting the country's ecosystem. Owing to these and other vulnerabilities, the government of Tuvalu has a vision to establish the state as a Digital Nation.

2.2. ICT Sector Overview

Tuvalu's ICT sector is characterized by a single government-owned telecommunications provider, Tuvalu Telecommunications Corporation (TTC). TTC is the sole provider of the government's telecommunications services to the entire nation using 3G, 4G LTE, and eventually 5G technology. TTC provides fixed, mobile, and satellite broadband services, predominantly on two of the nine islands — Funafuti and Vaitupu.

TTC is also progressively installing satellite facilities for mobile and WiFi connectivity on some outer islands, which require government or donor funding. TTC has expanded 4G services to three outer islands, providing high-speed internet access by leveraging the new low Earth orbit (LEO) satellite connectivity. On the other islands, WiFi service is being extended; however, for the uncovered areas, users must physically walk to an area with good WiFi coverage with their own devices for internet access. The available bandwidth remains very limited; hence, the quality of service is a challenge.

Digital Infrastructure Development

The following table provides a list of telecommunications infrastructure that is either in use or planned for deployment in Tuvalu.

Current Infrastructure:
- Copper network – for fixed line services to homes, businesses, and government offices, primarily on the main island. This is progressively being replaced by fiber to homes and businesses.   4G LTE – currently on the main island and three outer islands, with the plan for entire nation coverage   - Gigabit-capable Passive Optical Network (GPON) / 10-gigabit Symmetric Passive Optical Network (XGS-PON) – project in progress
New Developments:
- Cloud services – in partnership with Amazon Web Services (AWS)   5G and Open RAN Technology – currently being considered by TTC   - Google submarine cable – sponsored by Australia, New Zealand, Taiwan, Japan, and the US   - Starlink Community Gateway – in progress   - Mobile money – near completion

Digital Status, Coverage, and Penetration

As of the beginning of 2024, Tuvalu has progressed in digital technology accessibility and adoption as TTC and the government progressively expand their digital transformation plans using 4G LTE and satellite broadband technology. This is evident in the statistics shown in the table below:

Table 1: Basic Indicators

Population (11.4 thousand)	51.2% male 48.8% female 66.5% live in urban areas 33.5% live in rural areas
Market penetration (3G, 4G)	68.2% on Vaitupu and Funafuti
Mobile broadband coverage (of the total population)	3G: 58.37% on Funafuti 4G: 68.2% on Vaitupu and Funafuti
Total mobile broadband connections	4,693, about 41% of the population
Social media users	6,000
Internet users	9,285

Source: GSMA, and DataPortal.com

<u>ICT Policies and Legislations</u>

The following policies and regulations enacted by the government give guidance and empower the government to meet its digital transformation objectives:

a) Tuvalu National Telecommunications Corporation Act
b) Tuvalu National ICT Policy
c) E-commerce legislations
    o Consumer protection
    o Data protection
    o E-transactions
    o Cybercrime

<u>Cybersecurity</u>

A Cybersecurity Capacity Maturity First Review report has been completed, but the Cybersecurity Bill has yet to be tabled in Parliament for endorsement.

2.3 National Broadband Plan SWOT Analysis Workshop Results

In February 2024, in collaboration with MTECI and TTC, DCCP Pacific conducted multi-stakeholder workshops and engagements on Tuvalu's National Broadband Plan, Digital Government Plan, and Cyber Hygiene Training. The workshop brought together key stakeholders from the government, private sector, small-medium businesses, NGOs, women's groups, persons with disabilities, youth, students, and underserved communities. The key goals were to develop a national broadband and implementation plan for Tuvalu, support Rural Broadband Policy Framework (RBPF) efforts, develop a digital government plan for Tuvalu, and support digital skills development for the public sector and academia.

One of the key outcomes from the workshop was the SWOT analysis results summarized in the succeeding tables.

Group 1: Infrastructure and Affordability

Strengths	Weaknesses
- Small scale - Small population - Telecom - IT experts	- Transportation - Logistics - Land space - Remoteness - Lack of funding - Lack of capacity - e-waste - Vendor lock - Legacy system
Opportunities	**Threats**
- Development partners - Funding - Donor funding	- Seaspray - Climate change - Coastal erosion - Inundation - Cyber threats

Group 2: Universality and Digital Services

Strengths	Weaknesses
- Access to internet "No one left behind"	- Not all have access - Affordability – not everyone can afford - Reliability
Opportunities	**Threats**
- e-learning - Access to information - e-commerce - e-health - Data integration	- Cultural barrier - Cyber attacks/crimes (security) - Health-related issues

Group 3: Market Competition/Expansion

Strengths	Weaknesses
- Introduce new/more service providers - Improve competition + reduce prices = improve efficiency and speed	- Money outflow overseas - Lack of resources - financial - Equipment
Opportunities	**Threats**
- e-commerce boosted - e-banking - Enforcement of law reforms	- Cybersecurity issues - Legal restrictions for new vendors (too strict) - TTC will die

● TTC to improve its services	

Group 4: Digital Skills Development

Strengths	Weaknesses
● Sustain culture ● Youth pop (phone availability) ● IT curriculum in schools	● Lack of capacity ● Resist change in technology ● Lack of resources
Opportunities	Threats
● Distance e-learning ● Develop an app sustainable for the Tuvalu environment ● School ● Translation ● e-commerce	● Brain drains ● Cyber risks ● Digital scams

Group 5: Gender Equality and Social Inclusion

Strengths	Weaknesses
● Infrastructure ● Improve connectivity ● Improve quality of life ● Affordability ● Improve education ● Accessibility ● Access to information	● Infrastructure ● Contributing to the impact of climate change ● Occupied land space ● Affordability ● Expensive device ● TTC expensive data ● Accessibility ● No specialized assistive technology
Opportunities	Threats
● Infrastructure ● Use renewable energy technology ● Affordability ● Provide more cheaper, reliable data connection ● Accessibility ● Provide specialized assistive technology	● Infrastructure ● Contribute to climate change ● Affordability ● Misuse of opportunity ● Accessibility ● Young generation accessibility to the internet (cyber harassment, cyber bullying)

These inputs provide additional information and context as to how stakeholders perceive the sector. They serve as a reminder that even when strengths and opportunities seem clear, challenges and threats can undermine the vision of digital development.

3. Vision, Definition of Terms, Guiding Concepts

This section sets out the overall vision of the National Broadband Plan, its formal definition of the concept of broadband connectivity, and the guiding principles to support the plan's development and implementation.

3.1. Vision for Universal, Meaningful, and Affordable Broadband Connectivity

Tuvalu's vision for broadband ICT connectivity and use is for every citizen and group to be able to participate fully in the modern digital society and economy. This means achieving universal access to meaningful and affordable broadband connectivity. As stated by the ITU:

"Achieving universal and meaningful digital connectivity — the possibility for everyone to enjoy a safe, satisfying, enriching, productive and affordable online experience — is key for enabling digital transformation and meeting the Sustainable Development Goals."

The overriding goal of this broadband plan is to facilitate and ensure that universal, meaningful, and affordable broadband connectivity becomes available in an equitable and timely manner for all members of the Tuvalu community and that they can utilize and benefit from advanced and innovative digital technologies in all aspects of their lives. The succeeding table provides an overview of this vision and what it requires from policymakers.

Figure 1: Aspirational Targets for 2030

A holistic view of broadband policy

To close the digital possibilities divide, we need policymakers to set ambitious visions for universal, meaningful, and affordable broadband. Each of these components plays a part in building together a holistic view of what broadband policy needs to be.

UNIVERSAL	MEANINGFUL	AFFORDABLE	BROADBAND
The internet should be available to everyone to use and benefit from. This includes closing disparities by gender, rurality, and age to ensure that digital transformation projects are inclusive and available to all.	In addition to infrastructure, people need adequate skills and rights to participate online. They need adequate policy and regulatory frameworks that provide network security, personal safety, and local content ecosystems that encourage participation in the online world from new users.	Access cannot be so expensive as to be available only to some or only on a limited rationing based on someone's ability to pay. Devices and data tariffs need to be sufficiently affordable at multiple income levels for connectivity to be meaningful for us all.	The quality of connectivity has an impact on user experience and the possibilities of this technology to transform lives. To be meaningful, broadband needs to be at least 4G-like speeds with an unlimited access point at home, work, or a place of study. Everyone should have a smartphone they can use independently on a daily basis.

Source: GDIP, Closing the Digital Possibilities Divide: A Call for Universal, Meaningful and Affordable Broadband, 2024.

3.2. Definition of Broadband

Under this plan, broadband connectivity and service follow the guidance provided by the ITU and adopted by member states under the Universal Meaningful Digital Connectivity Framework and the Aspirational Targets for 2030. As such, broadband must be "of high quality, allowing for a fast and reliable connection" and require a minimum of 4G-like speeds with unlimited access.

As shown in Figure 1, Aspirational Targets for 2030, it is important to note that work is evolving on the definition and measurements of digital skills, especially as they relate to "a safe, satisfying, enriching and productive" experience for women and men. This is a critical step in supporting the expansion of digital possibilities for all.

3.3. Guiding Concepts

This broadband plan endorses and incorporates the key guiding concepts of the Tuvalu National ICT Policy, including the following:

- Economic Agenda: Te Kete, Tuvalu's National Strategy for Sustainable Development (2021-2030), highlights the importance of putting ICT at the forefront of the national economic agenda, given the critical role the ICT sector plays as a pillar of national development. A nation can only become a leader in the digital space when it recognizes ICT as key to its economic agenda.

- Cultural Values: Te Sikulagi, Tuvalu's 2020 Foreign Policy, promotes the importance of Tuvaluan values in enacting global diplomacy. The nature and implementation of ICT developments dovetail with Tuvaluan values, including innovation, extended family systems, kaitasi, or shared responsibility, falepili, or positive neighborly relations, and fenua o tagata, or the ability to survive in difficult conditions. This demonstrates the potential for a values-based and culturally sensitive approach to ICT development.

- Ubiquitous Access: All citizens must have access to reliable, affordable, and high-speed internet connectivity delivered through robust broadband and mobile platforms. Accessibility includes the availability of supporting and adaptive technologies and devices for persons with disabilities.

- Constitutional Principles: ICT can be used to develop an open and transparent government service to improve government accountability and efficiency, provide better service delivery, and protect the rights of the people of Tuvalu now and in the future.

- Private, Civil, Public, and Academic Sectors: Private, civil, public, and academic sectors must be promoted through the use of ICT so as to foster entrepreneurship, innovation, investment, and growth.

- Sustainable Development: ICT must be promoted to achieve sustainable development, accelerate human development, and foster a knowledge society.

- Cybersecurity and Cyber Safety: Cybersecurity awareness and protection should be promoted at all levels in the community, and a cyber-safe society must be created.

- Regulations: Modern, independent, and proportionate regulations for ICT must be established.

- Disaster Risk Management: ICT must be used as a tool to facilitate effective disaster risk awareness and training nationwide.

- Climate Change: ICT infrastructure and systems must be climate-proof, and ICT-based systems should be used to monitor the environment so that Tuvalu can adapt to the adverse effects of climate change. ICT must be used as a platform for digitizing Tuvalu's records, archives, and administrative services and creating a digital nation that can survive any climate-change-related shocks.

In addition, it calls for a gender-transformative approach to policymaking. As such, it recalls the UN Women's definition and recommendations.

● Gender Transformative Policies: Gender transformative policies refer to solutions that directly aim to transform power dynamics and structures that maintain gender inequalities. It uses approaches that directly tackle policy questions from a gender perspective, and goes beyond the "symptoms" of gender inequality to address the norms, attitudes, behaviors, and social systems that underlie them. (UN Women Generation Equality, Action Coalition Technology & Innovation for Gender Equality. Gender x Innovation Guide)

4. Summary of Broadband Plan Themes and Approaches

The main elements of the broadband plan are described in the following sections.

Part II identifies the key focus areas of the plan. These involve primary sectors for strategic development, along with target results to be achieved. They include:

- Focus Area 1: Broadband Infrastructure and Services: The broadband network connectivity needed for citizens, businesses, and the government to be able to access affordable, quality internet and all online services and capabilities.
- Focus Area 2: Affordable and Fully Accessible Smart Devices: The need for all broadband users to have access to affordable, high-quality smart devices.
- Focus Area 3: Broadband in Business Applications and Content: The need to develop and ensure access to a robust commercial ICT sector, providing a wide range of useful, beneficial, and valuable broadband ICT applications and content.
- Focus Area 4: Broadband in Education, Training, Capacity Building: The role of broadband ICTs in all aspects of education and related training and capacity-building objectives, including digital skills and literacy.
- Focus Area 5: Broadband in Government and Public Services: The adoption and utilization of broadband-based technologies within government at all levels.

Part III describes the implementation strategies and actions required to achieve the objectives of the broadband plan. These include the following sections:

- Implementation Oversight and Action Plans: The institutional framework for overseeing and managing the implementation of the plan.
- Monitoring and Evaluation: The parameters of monitoring and evaluation of the implementation, including institutional responsibility.

Part II: Focus Areas of Broadband Plan

This section presents the key focus areas of the National Broadband Plan. There are five main focus areas:

1. Infrastructure and Services
2. Affordable and Fully Accessible Smart Devices
3. Business Applications and Content
4. Education, Training, Capacity Building
5. Government and Public Services

The plan provides an overview discussion, the objectives and targets associated with each focus area, and key strategies for achieving those goals.

5. Focus Area 1: Broadband Infrastructure and Services

5.1. Overview

This focus area addresses broadband network connectivity needed for Tuvalu citizens to be able to access the internet, mobile data apps, and related services and functions. 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.

Key elements of this focus area include:

- Mobile broadband networks and services: Mobile services are the most common and widely utilized form of communication accessed by citizens worldwide, including in Tuvalu. The technology standards for mobile broadband have been evolving, with the former standard of 3G quality no longer considered adequate for most high-speed data applications. As technology advances, 4G+ and 5G quality services have become the worldwide standard for a true and meaningful   broadband   experience.

  Tuvalu's objective is to ensure that at least 4G level service is reliably available to all citizens, micro, small, and medium enterprises (MSMEs), and other user organizations throughout all populated islands at affordable prices. This goal requires significant investment in backhaul infrastructure, satellite capacity, and local towers and base station network transmission facilities. While TTC will be the primary provider of this infrastructure and service, there may be options to encourage local community service providers to partner with TTC in some cases.

- Fixed access broadband networks and services: Local fixed access broadband networks can provide permanent connections to a subscriber's premises, whether to a household or residential complex, an office building or other business setting, government offices, university campuses, and similar institutional locations. These may utilize fiber-to-the-premise technology (FTTx), fixed wireless access (FWA), or other radio-based connections. The quality and reliability of signals are typically higher than those of mobile broadband, although costs can also be higher. Under this

plan, the goal will be to expand the availability of fixed broadband connectivity, especially to business and institutional users, as much as possible.

- Satellite broadband networks: Satellite technology bridges the gaps that mobile and fixed broadband networks cannot reach, and it is uneconomical to invest in sparsely populated rural and remote communities. Satellite technology will extend the broadband reach beyond cables and fiber. TTC has invested in satellite technology deployment in some of the rural areas in Tuvalu for internet connectivity to the communities. One of Tuvalu's providers or suppliers of satellite broadband services is Kacific Satellites.

  The satellite options can be via geostationary satellites (GEO), medium Earth orbit satellites (MEO), or low Earth orbit satellites (LEO). Tuvalu may also consider a hybrid broadband network combining satellite broadband with other technologies (4G, 5G, and fiber) to create more robust and comprehensive broadband connectivity to ensure more citizens have access.

- Public access broadband services: Public access broadband facilities can offer a valuable option for individuals to obtain affordable access to broadband services. Such services can be provided via public cyber cafés or community access centers, offering computers with broadband connections, printers, and other equipment, as well as training and support. They may also provide public WiFi signals within and near a facility or through community-wide WiFi networks. These signals may be accessed via smartphones or other internet-enabled devices. Service, pricing, and usage arrangements can be flexible to allow for affordable or free services and premium options to generate revenue to support the services.

  A key goal of this plan is for the government of Tuvalu to promote and support public broadband access options throughout the country, especially for low-income and rural users. Inspired by the Rural Broadband Policy Framework, this plan reflects evidence-based good practices that guide digital connectivity policy.

5.2. Objectives and Targets

Mobile broadband access and service

- 100% of Tuvalu's population should be able to receive high-quality (4G or higher) mobile broadband service by 2027, with potential upgrades to 5G service by 2030.
- Retail consumer broadband prices should be affordable according to United Nations targets of no more than 2% of monthly income, differentiated by income quintiles, by 2030.
- At least 80% of the adult Tuvalu population will subscribe to and use mobile broadband services by 2030.
- Broadband mobile services will be available and used equally by men and women and fully accessible to and utilized by persons with disabilities.

Fixed broadband access and service

- Fixed broadband network options will be deployed to allow high-capacity connections to public institutions and business sites on each island by 2028.

Public access broadband services

- At least one community public access facility and/or community Wifi service will be deployed and available on each island by 2028, offering public broadband services for low, affordable prices.

5.3. Strategies

Investment

- TTC and the government will continue to invest in mobile communications infrastructure, upgrading network capacity and quality to 4G+ and expanding to cover all populated areas of all islands. TTC will continue to explore options for upgrading further to 5G and Open RAN technology platforms.
- TTC will actively pursue the new Tuvalu cable project to expand backhaul network connectivity and capacity, ensuring adequate transport speeds, reliable broadband services for end users, and significant cost reductions.
- TTC will work with local entrepreneurs and public institutions to develop plans and deployments of fixed broadband access services, both on Funafuti and all other islands.
- TTC will continue to explore alternative and lower-cost satellite backhaul options.

Policy and regulatory

- MTECI will review and update policies and regulations relating to licensing and infrastructure deployment to ensure that the most efficient incentives and opportunities for investment in broadband infrastructure are available to TTC and the market.
- MTECI will review and update regulations on spectrum allocation and assignments to encourage the most efficient use for new and expanded broadband coverage.

- Fees and taxes for telecom industry providers should be reduced and minimized to the extent possible to encourage investment in broadband technologies, with particular incentives for rural networks and public access.
- Local fees for right-of-way access on public lands should be minimized and harmonized, and permit procedures should be streamlined on a national basis.
- Options for granting licenses to low-cost satellite service providers will be considered.
- The government will pursue cross-sector policies to promote infrastructure sharing between utilities such as energy and telecom and support efficient planning of construction projects.

Partnerships and public projects

- The government will review options for providing additional budget support to broadband infrastructure investments.
- The government and TTC will actively pursue additional donor-funded support for infrastructure upgrades.
- Public institutions will work with local community access providers to share resources, infrastructure, and capacity, including building spaces and available lands, to support public community ICT access facilities.

6. Focus Area 2: Affordable and Fully Accessible Smart Devices

6.1. Overview

This focus area addresses the need for all broadband users to have access to affordable and accessible high-quality smart devices which can fully connect to the internet and applications. These include:

- <u>Affordable smartphones for individuals, households, and small businesses</u>: Advanced smartphones are essential to the complete online, meaningful connectivity experience. Small business entrepreneurs also need advanced smartphones to enable business operations, customer contacts, mobile money, and other benefits. Although costs have been dropping, these are still not affordable to many citizens, households, and entrepreneurs.

  As broadband mobile services become more available and affordable, Tuvalu must ensure that smartphone ownership becomes a real option for everyone. This will involve a combination of strategic investment, subsidies, and incentives for all who cannot afford such phones.

- <u>Personal computers, laptops, and tablets</u>: Traditional computers and other larger devices are needed by many businesses and institutions to support more complex functions, such as data management, storage, audiovisual applications, and more. Programs to support access to PCs, laptops, and tablets should be targeted to organizations that will benefit most, such as schools, government offices, and medium businesses.

- <u>Other smart devices and Internet of Things</u>: Tuvalu must also continue to advance with evolving technology and take advantage of new connected devices wherever possible. The government will explore partnerships and investments that will be of value to society and help achieve long-term goals by incorporating new types of equipment and devices and promoting their affordable adoption and use.

6.2. Objectives and Targets

Smartphone penetration and adoption
● All subscribers to broadband mobile services will have access to smartphones with advanced quality features, reaching at least 80% of the adult population by 2030. ● Ownership and adoption of smartphones by women equal to that of men by 2030. ● Ownership and adoption of accessible, customized smartphones or equivalent smart devices for persons with disabilities will reach at least 60% of this designated population by 2030.

PC, laptop, tablet penetration, adoption
● Penetration and use of PCs, laptops, and/or tablets – with broadband connections – will reach 50% of micro, small, and medium enterprises in Tuvalu by 2030. ● Annually increasing levels of import and adoption of at least 5% per year.

Advanced devices penetration, adoption
● Annually increasing levels of import, purchase, and adoption of advanced devices to achieve at least 25% business and institutional penetration by 2030.

6.3. Strategies

Investment

- The government will design bulk purchase agreements with device suppliers to purchase devices for public agency use, which may also be offered to private enterprises at public discounts.
- The government will adopt policies to finance the import and low-price distribution of devices with accessibility features for persons with disabilities, such as compatibility with software that provides screen magnification and screen reading functionalities.

Policy and regulatory

- The government will minimize or waive any import tariffs on smartphones, PCs, and other advanced ICT devices.
- Government authorities will work with commercial interests, including private sector corporate social responsibility (CSR) teams, to design tax incentives, deductions, and credits for the purchase and adoption of smart devices by small businesses.
- Fiscal authorities will develop tax incentives for suppliers of smart devices to reduce prices for low-income and small business users.

<u>Partnerships and public projects</u>

- TTC will cooperate with the government and phone vendors in developing affordable smartphone purchase initiatives, including low-income subsidies, discounts, and new financing mechanisms to facilitate the acquisition and reduce risks.
- Participants in Digital Tuvalu will receive incentives, such as free or low-priced devices, in exchange for their contributions.
- Donors will be pursued to provide targeted device subsidies, particularly for schools, health facilities, and other public service institutions.

7. Focus Area 3: Broadband in Business Applications and Content

7.1. Overview

This focus area addresses the role of broadband in the Tuvalu business community, including support for commercially and socially valuable applications and content. Tuvalu's digital economy will depend upon the development and use of a broad range of applications that are universally available and adopted throughout society. The advantage of digital technologies is that anyone, from individual creative entrepreneurs and artists to advanced software and application developers, can build and market their original content, and consumers and other businesses can gain from these efforts.

Tuvalu will encourage and support initiatives to design, upload, circulate, and market original national content, including culturally and historically valuable broadband-based information sources. These will be encouraged for the economic, social, and educational opportunities they will provide, including contributions to the Digital Tuvalu flagship project (see below).

Key categories of support for business, applications, and content development will include:

- Applications and software development: Support for domestic software designers and engineers in both training and applying skills and utilizing Tuvalu-based software providers wherever possible in public digital projects, including Digital Government.

- Digital finance: Development and implementation of effective digital finance and mobile money applications and their adoption by consumers, businesses, and the government in support of all forms of purchases and procurements.

- Cultural information, entertainment, and social media: Users will be encouraged, through incentives, training, and other programs, to create and share content that highlights Tuvalu's unique culture, environment, and people. This will be coordinated under the Digital Tuvalu project.

- Security and protection: The government will protect vulnerable users from dangerous, fraudulent, inappropriate, and harmful media content but will not restrict the free flow of information, ideas, and creative expression.

7.2. Objectives and Targets

Applications and software development

- The number of established MSMEs operating in the ICT sector will increase annually by at least 20 new or expanded/transformed digitally-based enterprises per year through 2030.
- By 2030, at least 75% of Tuvalu businesses will adopt and utilize digital and online technologies to support their business practices (via e-commerce, social media marketing, online transactions, internet-based accounting and support services, etc.).

Digital finance

- At least 50% of consumer and business financial transactions will be made via digital payment systems by 2030.
- The government will conduct at least 75% of public procurements and payments via digital financial transactions by 2030.

Cultural information, entertainment, social media

- Users uploading original content to social media and other sites will reach at least 75% by 2030.
- The Digital Tuvalu project will develop, receive, organize, and host at least 5,000 unique Tuvalu cultural items (photos, videos, archive files, and stories) by 2030.

Security and protection

- All public entities will adopt official cybersecurity protections and protocols by 2030.
- Recorded incidents of cybercrime, identity theft, online fraud, and other digital transgressions will decline annually, and measures of resolving and preventing such crimes will increase.

7.3. Strategies

Investment

- The government and donors will support the adoption of business digitization initiatives through targeted funding grants to qualified MSMEs.
- The government and donors will develop and finance a public ICT incubator initiative to encourage small entrepreneurs to design and market digital applications and services on a commercial basis.
- Private businesses will expand the adoption of digital technologies, including financial and mobile money applications.

Policy and regulatory

- MTECI will review laws and regulations on information content hosting and sharing to encourage Tuvalu-based users to be able to provide innovative and valuable content and applications without undue restrictions or costs.
- To support the expansion of this market in Tuvalu, policies and regulations for online services, domestic e-commerce businesses, and commercial mobile applications will be streamlined, including tax reductions and incentives.
- The government will reinforce and expand resources for prevention, investigation, education, and intervention to reduce instances of online abuse, misinformation, and security threats at all levels.

Partnerships and public projects

- The government and donors will expand and highlight the Digital Tuvalu project to incentivise citizens and organizations to upload national cultural and historical content to the project. Such incentives may include reduced service and device costs for registered Digital Tuvalu users, including schools and students who may receive credit for contributing content.

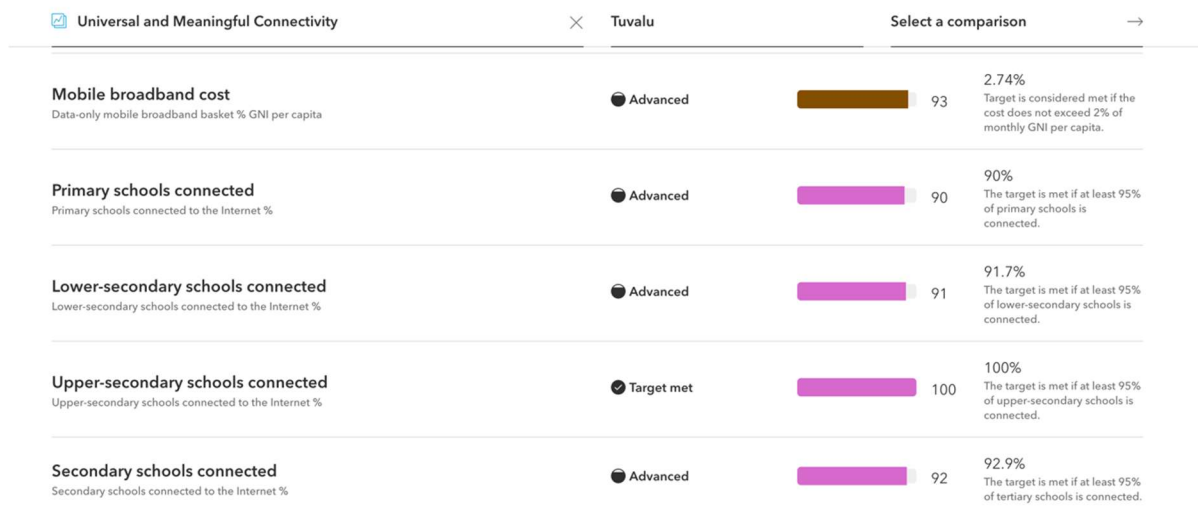# 8. Focus Area 4: Education, Training, Capacity Building

8.1. Overview

This focus group addresses the role of broadband in all aspects of education, training and capacity building in Tuvalu, with a priority goal of enabling citizens, students, and entrepreneurs to take maximum advantage of the benefits of broadband ICTs in their lives and occupations. The main elements include:

- Broadband in public education: The ability to use digital technologies at all levels of the education system is increasingly important. While physical schools and in-person teaching remain the most vital sources of education, online resources can complement traditional learning in many ways, such as digitally enhanced curriculum and materials that are accessible for persons with disabilities, online research and training sources, and the ability to connect remotely with teachers and schools throughout the country and the world. Broadband technologies also facilitate more efficient school administration and teacher training.

  These requirements must be supported by a coordinated digital education policy under the Ministry of Education, which ensures that they will be utilized effectively in combination with traditional public, teacher-centered education.

  According to the ITU, a significant percentage of Tuvalu's schools are connected to the internet at a meaningful level of broadband connectivity (see figure below). However, there is no information about the level of adoption among students, teachers, and administration or if connectivity has facilitated education outcomes or motivated the development of a digital education policy or initiative.

Universal and Meaningful Connectivity	✕	Tuvalu	Select a comparison →	
Mobile broadband cost Data-only mobile broadband basket % GNI per capita	● Advanced	▬▬	93	2.74% Target is considered met if the cost does not exceed 2% of monthly GNI per capita.
Primary schools connected Primary schools connected to the Internet %	● Advanced	▬▬	90	90% The target is met if at least 95% of primary schools is connected.
Lower-secondary schools connected Lower-secondary schools connected to the Internet %	● Advanced	▬▬	91	91.7% The target is met if at least 95% of lower-secondary schools is connected.
Upper-secondary schools connected Upper-secondary schools connected to the Internet %	✔ Target met	▬▬▬	100	100% The target is met if at least 95% of upper-secondary schools is connected.
Secondary schools connected Secondary schools connected to the Internet %	● Advanced	▬▬	92	92.9% The target is met if at least 95% of tertiary schools is connected.

Source: ITU Universal and Meaningful Connectivity DataHub

- Broadband in universities: The role of broadband ICTs in university education is even more important than in public primary and secondary schools. Computers, digital curriculum, and online access are essential to modern higher education, and any students or campus lacking these technology resources are severely disadvantaged. This is equally true for the Maritime Training Institute and the University of the South Pacific campus in Tuvalu, as well as for technical training schools (see next section).

  University-level broadband ICT resource needs fall into three general categories: equipment, such as computers, smart boards, and audiovisual devices; software and applications to support digital curriculum, testing, remote learning, and administration; and broadband connectivity, including classroom and laboratory connections and campus-wide WiFi. All of these must be widely available to support a technically advanced and robust tertiary education experience.

- Technical training and ICT awareness programs: Effective adoption of broadband technologies in Tuvalu will depend critically upon strong and widespread awareness and skills in the use of these technologies throughout the population. Tuvalu has established solid technical training resources, such as the Tuvalu Atoll Science Technology Training Institute (TASTII) and the Australian Pacific Training Coalition (APTC). These institutions and other public and private-led programs must be reinforced and harnessed to support the population's need for capacity building and awareness in all facets of broadband adoption and use. Special attention should be given to digital skills training programs to meet the needs of rural and marginalized populations.

  Technical skills development initiatives will focus on industry-oriented education and specialized skills enhancement for employees in the private and public sectors. These may be provided through one of the training institutes, by TTC, by other businesses, and/or by the government, in a coordinated manner. Public ICT awareness programs will also be sponsored by the government, the private sector, and the education sector. Public participation in national digital resource initiatives will also serve as a training and awareness opportunity (see Digital Tuvalu flagship project below).

8.2. Objectives and Targets

Broadband in public education
● 100% of schools will have meaningful broadband connectivity by 2030.

Broadband in universities
● 100% of university campuses will have meaningful broadband connectivity by 2030.

Technical training and ICT awareness programs
● An ICT in education policy and program in place by 2027, including teacher and administration training programs to improve digital technology contribution to education performance and outcomes, as well programs to address the needs of people with disabilities and other marginalized population groups, such as women and girls, and rural populations. ● Provide basic digital skills training to at least 75% of the adult population by 2030.

8.3. Strategies

Investment

● The government and donors will support investment in infrastructure to secure meaningful broadband connectivity in all educational institutions (from elementary schools to adult education centers), as well as the availability of education-ready devices and labs (both for learning and research), including computers and tablets, classroom digital whiteboards, local area networks, WiFi servers, and other IT-related infrastructure and tools to support education outcomes.

Policy, regulatory

● Develop and design an ICT in education policy in coordination with MTECI and other relevant ministries and agencies, including those leading the Digital Tuvalu project.
● As part of the above policy, develop guidelines for digital citizenship and digital skills training programs focused on citizens' ability to use broadband access in a safe, private, and human rights-respecting manner.

Partnerships, public projects

● The government and donors will expand and highlight the Digital Tuvalu project and its important role in the digital learning journey of all students. Students across educational levels will be incentivized and supported to create and develop new content, collaborate among schools, and contribute to the Digital Tuvalu project.

9. Focus Area 5: Government and Public Services

9.1. Overview

The government of Tuvalu recognizes that the full achievement of the country's national broadband ICT objectives depends strongly upon the adoption and utilization of these technologies within the government itself and at all levels. Toward this goal, the government has adopted the Digital Government Plan, with the goal of expanding and adopting ICT resources across the Tuvalu public sector through the adoption of common digital standards, platforms, services, and practices. The key components are:

1. Digital infrastructure and technology
2. Digital and electronic services
3. Data governance and management

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. The key areas of focus are as follows:

- E-government infrastructure and network connectivity:

National broadband is critical to enabling Tuvalu's digital government services, commonly known as e-government. Achieving digital government requires a robust infrastructure and seamless network connectivity to ensure government services are accessible, efficient, and secure. The infrastructure includes a scalable, cost-effective, and efficient broadband network, data servers and storage, cloud computing, software solutions, and cybersecurity infrastructure.

Broadband network connectivity supporting government services and the interoperability between government departments and agencies will include wide area networks (WANs), local area networks (LANs), mobile networks, virtual private networks (VPNs), fibre optics, wireless technologies, satellite, and the Internet of Things (IoT). These are fast, reliable, encrypted, and efficient, ensuring timely connectivity, secure and efficient data exchange and collaboration, privacy and security of information, and improved and timely government services.

The implementation of the digital government involves public-private partnership support and collaboration to leverage expertise and resources and encourage investment through incentives and supportive policies. Through collaboration, develop policies and regulations to ensure data protection, establish and agree on standards and procedures, and launch initiatives to improve digital skills and awareness on how to use the digital government service.

By ensuring high-speed internet access and delivering robust and secure digital infrastructure, the Tuvalu government can ensure reliable and inclusive public service delivery, promote economic growth, digitally empower society, and improve the quality of life for its citizens.

● Digitalization of public services and data:

Current manual or semi-digital public service delivery mechanisms are proving to be cumbersome, time-consuming, inefficient, discriminatory, siloed, ineffective, and antagonistic to societal development. The Digital Government Plan and the broadband plan address these challenges. Digitalizing public services and data will involve converting traditional and manual government processes and records into digital formats. Manual processes will be automated using digital workflows, software applications and digitally connected ICT ecosystems. Capital investment will be required to either enhance existing systems or implement new and agile software solutions. Policies, procedures, agreements, and collaborations are made for interoperability between government departments and agencies to share and facilitate harmonious data exchange or synergies in the public services provided to the public.

Achieving digital process and data transformation leverages information and communications technologies to enhance the efficiency, accessibility, and transparency of government services and improve citizen support and engagement. The benefits of the digitalization of the public service are:

- Improved accessibility – more accessible to citizens, including those in remote areas and persons with disabilities
- Increased efficiency – faster service delivery, reduced processing time, minimizing errors, and accelerated collaboration between departments, agencies, and non-government partnerships
- Enhanced transparency and accountability – digital records are tracked, auditable, and transparent to all with relevant access
- Effective data management and security – digital records are stored, backed up, secure with improved integrity, and compliant with existing data protection and regulations
- Enhances data-driven decision-making – readily available data provides valuable insights for informed and effective government decisions

● Public service employee training:

Embarking on emerging broadband technologies and digital government solutions will improve government services, boost economic benefits, and transform lives. However, a lack of skilled government employees in key sectors inhibits the proper and safe use of digitally enabled services and applications. It is incumbent on the government, with the support of private and civil society partners and donors, to embed digital skills training for government employees and general government service users.

Capacity-building policies, training programs, and change management should address training, reskilling, and building the capacity of government employees as part of the digital government implementation plan. Investment in this is a necessity. This will ensure a digitally skilled and competent workforce that can then participate in the digital transformation endeavor.

9.2. Objectives and Targets

E-government infrastructure and network connectivity

- E-government network and connectivity to 50% of national office sites by 2027, and to 100% of sites by 2030
- Connectivity at 100% of local government sites on all islands by 2030.

Digitalization of public services and data

- Digitalization of 50% of priority government service functions by 2027, and 100% by 2030.
- At least 70% of citizens will utilize one or more digital government services by 2027, and at least 90% by 2030.

Public Service employee training

- At least 75% of designated government employees will be trained in digital functions by 2027, and 100% by 2030.

9.3. Strategies

Investment in connectivity and equipment

- The government and TTC will collaborate on designing and implementing a national e-government network based on fixed broadband connections to all public buildings and offices on all islands.
- Cross-government development of a comprehensive procurement plan for needed advanced digital equipment appropriate to agencies' missions: computers, servers, laptops, tablets, smart devices, and peripheral equipment.

Digitalization of public services

- Develop a comprehensive digitalization plan and timetable that fully addresses issues of existing processes and services, data collection and management, interdependencies, supporting systems, infrastructure, guiding policies, and partnerships. The digitized data will be securely stored, backed up, and accessible at any point, with multiple copies in different locations for disaster recovery and business continuity.

- The key government services and data that should be prioritized for digitalization as part of the digital government are:

  a. **Civil and identification registration records** – this includes birth, marriage, national ID, passport, and visa services and data.
  b. **Financial and taxation services** – tax filing and payments, superannuation services, social security, pensions, subsidies, grants, and public services fees.
  c. **Education services** – student enrolment and studies, training, scholarships, grants, e-learning, and online courses

d. **Healthcare services** – patient records, appointments, referrals, remote or online consulting, telehealth services, hospitals, clinics, specialist services
e. **Public safety and justice** – police records, crime reporting, case management, court filing and scheduling, crime reports and investigations
f. **Employment and labor services** – public servants, benefits and entitlements, training and development, jobs, organizational structures, and online portals
g. **Land and property management** – land records, titles and deeds, payment, utility fees and payments, property taxes, building permits, and land taxes
h. **Departments and sector** – departments, sectors, structures, and employee records
i. **Public utilities** – utility providers, payment records, consumers, water/electricity/land rates bills
j. **Social services** – welfare services, assistance programs, and child and family services
k. **Business and commerce** – business registration, licensing, renewal processes, regulatory compliance, tenders, procurement system, and government contracts

Public employee training

● In partnership with academia and the private sector, formulation and implementation of a robust change management plan and associated activities for public employees, including a government workforce skills and gap analysis to identify and develop targeted training, awareness, and digital skills capacity building plans.
● Key elements of public employee digital skills training should include, at a minimum:
   o Digital literacy and basic digital skills
   o Business process transformation
   o Customer service excellence
   o Policy and regulatory knowledge
   o Public engagement and communication
   o Diversity, equity, and inclusion
   o Data management, analysis, and decision making
   o Specialist training

Part III: Implementation Strategies and Actions

10. Implementation Oversight and Action Plans

This section describes the institutional framework for overseeing and managing the implementation of the plan. It also describes the framework and timing for the initial action plans that must be developed by the oversight institution.

10.1 Institutional Framework

Primary responsibility for plan oversight will rest with MTECI, which will establish a Broadband Plan Oversight Office, which will be responsible for directing and monitoring the implementation in consultation with other stakeholders. A Broadband Steering Committee will also be established to develop shared plans, strategies, and coordinated initiatives across multiple interest areas. These roles shall consist of the following:

Ministry of Transport, Energy, Communications, and Innovation (MTECI)

- MTECI and the Department of ICT will manage and oversee all aspects of the broadband plan implementation in consultation with the Prime Minister's office, Tuvalu Telecommunications Company, and other key public and private sector stakeholders.

- MTECI will establish a Broadband Plan Office staffed with personnel responsible for overseeing and coordinating the plan's implementation. The Office will undertake regular liaisons with stakeholders involved in broadband projects and report to the Broadband Steering Committee. It shall have primary responsibility for drafting the progress and evaluation reports and other relevant reports and studies relating to the plan. Office personnel shall be appointed by the MTECI.

Tuvalu Telecommunications Corporation (TTC)

- TTC will be responsible for leading the planning and implementation of broadband network infrastructure and services projects under the broadband plan in coordination with its ongoing network and service development initiatives. TTC will collaborate with the Broadband Plan Office and participate in the Broadband Steering Committee.

Other government ministries

- Other key ministries will participate in the Broadband Steering Committee and be responsible for developing and contributing to plans directly affecting their areas of interest. These will include at least:

    o Ministry of Education and Human Resource Development
    o Ministry of Women
    o Ministry of Health and Social Welfare

       o   Ministry of Finance
       o   Ministry of Foreign Affairs, Labour, and Trade.

<u>Responsibilities of the Broadband Plan Office</u>

The responsibilities of the Broadband Plan Office within MTECI shall include the following:

- Regular liaison with stakeholders involved with broadband projects and report to the Broadband Steering Committee.
- Primary responsibility for drafting action plans in consultation with implementing partners, including estimations of budget requirements and funding options.
- Primary responsibility for drafting all progress reports and other relevant reports and studies relating to the plan. Collect data and provide progress reports from other stakeholders.
- Work closely with the implementing stakeholder agencies and partner organizations.
- Prepare an integrated roadmap for the overall plan, combining key elements of the implementation action plans and reconciling project timelines, milestones, budgets, and responsibilities.
- Prepare monitoring and evaluation reports in consultation with the Broadband Steering Committee members and other stakeholders.

<u>Broadband Steering Committee</u>

- A Broadband Steering Committee shall be established as a consultative body responsible for advising on and reviewing the plan's implementation. Members of the committee will be appointed by MTECI, in consultation with key stakeholders, and shall consist of representatives from both the government and the private sector.
- The Broadband Steering Committee shall meet no less than quarterly. The committee's role shall be to review quarterly progress reports, raise questions, concerns, or ideas to be addressed by the Broadband Plan Office and project implementers, and review and approve the progress reports.

10.2 Implementation Action Plans

The Broadband Plan Office will oversee the preparation of detailed implementation action plans for each program or distinct project to be undertaken within the broadband plan framework. These action plans go beyond the general overview and summary information in the main plan document. The implementation action plans will provide sufficient information for stakeholders and the public to understand the specific expectations for each project, the tasks required to achieve their identified target outcomes, the resources involved, and the associated time frames.

Information to be provided in each action plan will include, in general:
- Targets to be achieved
- What specific activities and inputs have been achieved
- What specific activities, inputs, and resources are needed
- Specific timetable of key milestones
- Stakeholder and personnel responsibilities
- Cost estimates for the plan, budget requirements and potential funding sources
- Any additional information needed to guide project implementation

10.3. Alignment with Digital Tuvalu, The First Digital Nation Project

The National Broadband Plan will be closely aligned with the Digital Tuvalu, the First Digital Nation project, which is already underway. It is also aligned with the Digital Government Plan.

Background

The government of Tuvalu is eager to accelerate digital transformation and digital government services to preserve the loss of land, ocean and culture with the aid of digital technology and solutions to deal with the loss of physical and cultural heritage. Tuvalu faces an existential challenge, with the possibility that the physical land of the country may be lost forever due to climate change. In response, at COP27 (2022), Tuvaluan Minister Simon Kofe announced that Tuvalu would become the First Digital Nation and digitally recreate its land, archive its rich history and culture, and move all governmental functions into a digital space.

According to the government's website, "This digital transformation will allow Tuvalu to retain its identity and continue to function as a state, even after its physical land is gone. It will also facilitate the governance of a Tuvaluan diaspora by creating a virtual space where Tuvaluans can connect with each other, explore ancestry and culture, and access new opportunities for business and commerce in various industries. Moreover, a permanent digital replica of Tuvalu – a new "defined territory" – will aid in the fight for continued sovereignty under international law."

Several steps have already been taken toward this objective. These include specific digital content actions:

- Completed a comprehensive three-dimensional LIDAR scan of all 124 islands and islets.
- Began building a living archive of Tuvaluan culture, curated by its people. Citizens will be invited to contribute their most treasured personal items for digital preservation, creating a living record of Tuvaluan values.

Broadband Action Plan Alignment

A key initial action plan will be developed to link the broadband plan to the Digital Tuvalu project. This plan will connect several of the focus areas and objectives of the broadband plan under a coordinated set of activities. The key features of this project will include:

- Affordable Broadband Service (Focus Area 1): Under the program, the government and TTC will arrange for registered Digital Tuvalu content providers to receive targeted service pricing discounts in exchange for their designing and uploading approved Digital Tuvalu content.

- Affordable, Accessible Broadband Devices (Focus Area 2): The program will offer discounted or free smartphones and laptops with customized applications for registered Digital Tuvalu content providers.

- Broadband Applications and Content (Focus Area 3): The program will support the development of Digital Tuvalu-specific applications, templates, formats, and other materials to guide registered content providers in the preparation and uploading of appropriate content to the overall project.

- Education, Training, Capacity Building (Focus Area 4): The program will collaborate with schools and universities to encourage the creation of Digital Tuvalu content as part of the curriculum, allowing students to learn the use of digital devices and applications, as well as the specific

purposes and features of the Digital Tuvalu project. Students will be among the priority registered content providers in connection with accredited educational programs.

Under the Digital Tuvalu project, the government will develop and implement each of the above features in close cooperation with the Broadband Plan Office, TTC, the Ministry of Education, universities and training institutes, and other key stakeholders. Details will be developed in a collaborative action plan to be adopted collectively by the participants. Funding support will be sought from donors, together with the available government budget.

10.4 Integrated Broadband Plan Implementation Roadmap

Based on the action plans, the Broadband Plan Office will prepare an annual integrated roadmap for the overall plan, reconciling project timelines, milestones, budgets, and responsibilities of each plan component. The goal of this exercise is to conduct a second "reality check" on the full scope of plans and needed activities and resources to reinforce the plan and enhance the likelihood that all of its targets can be achieved as planned. This roadmap will present the key information from each project plan, allowing direct comparison across projects. This information will include at least:

- Main program and project targets by year
- Linkages among projects and hierarchy of resources required
- Key milestones, levels of activity for each project by quarter
- Budget and personnel inputs

In developing the roadmap, the Broadband Plan Office will propose any adjustments to individual plan targets, milestones, and budgets necessary to reconcile the different components of the overall strategy with available resources. These recommended adjustments, if any, will be presented to the Broadband Steering Committee, and the results obtained will be used to modify the master broadband plan document and related action plans as necessary.

11. Monitoring and Evaluation

Implementation of the broadband plan and progress toward the targets must be regularly monitored and evaluated. This section describes the plan's monitoring and evaluation requirements, including institutional responsibility. It also establishes the need to review and revise the plan based on interim progress reports.

11.1 Institutional Responsibility

The primary responsibility for monitoring the plan shall be under the Broadband Plan Office within the MTECI. The office will also coordinate with other stakeholders and partners, including the Broadband Steering Committee involved with action plan implementation, to obtain data on progress as well as updates on any developments or constraints facing plan implementation.

11.2 Progress Reports

The Broadband Plan Office will prepare the following reports:

- Monthly data collection: Regular updates of information relating to project activities, budgets and expenditures, inputs and outputs of each project, and interim results. These will be collected internally and be available for review.

- Quarterly updates: At the end of each calendar quarter, the Broadband Plan Office will prepare a report summarizing all activities on all projects and objectives during the preceding quarter. This report will indicate work undertaken, progress toward objectives and targets, barriers or challenges encountered, and any recommendations for improvements or changes. The quarterly reports will be submitted for review at the Broadband Steering Committee's quarterly meeting, which will review and provide feedback and recommendations for any significant plan mid-course revisions.

- Annual Report: At the end of each fiscal year, the Broadband Plan Office will prepare a full annual report on the overall progress of implementing the broadband plan. This report will be based on the quarterly inputs (including the most recent quarter) and additional research and inputs to be conducted by the office, as appropriate. The annual report shall provide a full summary of annual expenditures, inputs, and outputs for each project and each major plan component.

   The report will compare progress and milestones achieved with previous forecasts and recommend adjustments to plan targets, budgets, and other elements for the upcoming year based on recent trends.

   The annual report shall be submitted to the Broadband Steering Committee for review, comment, clarification, and revision within one month of the end of the calendar year. The committee shall meet within two weeks of receipt and issue approval of the report within two weeks. Upon approval, the annual report shall be released to the public.

11.3 Plan Review and Revision

Following completion of the second-year annual report on the plan's implementation and results, the Broadband Plan Office will conduct an overall national broadband plan review to revisit and potentially revise plan objectives, programs, and projects, taking account of the results achieved and any other relevant recent trends in the ICT sector and Tuvalu society. The office will conduct stakeholder consultations in support of this review.

The plan review will take account of the implementation framework and activities to date based on the levels of effectiveness, participation, and challenges encountered. The review will also consider the role of the Broadband Plan Office and the Broadband Steering Committee in plan management and oversight, as well as the roles and contributions of other stakeholders.

Following completion of the review, the Broadband Plan Office will prepare a draft of the revised National Broadband Plan, which will be submitted to the Broadband Steering Committee for comment and approval. The revised plan will incorporate any appropriate mid-term changes to targets, priority projects, budgets, and time frames. It may also introduce new objectives or projects that are warranted by developments in the sector. The revised plan shall also address needed alterations to the implementation framework to improve its overall effectiveness.